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TEST PROCEDURES FOR TOLL CALL CERTIFICATION
ALTERNATIVES(U) ARMY INFORMATION SYSTEMS COMMAND FORT
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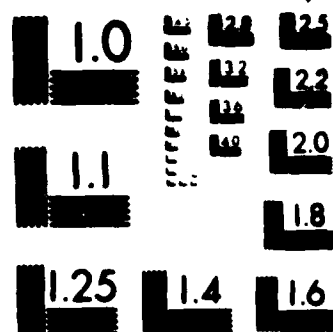
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REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) (U) Test Procedures for Toll Call Certification Alternatives		5. TYPE OF REPORT & PERIOD COVERED Final Sep 86 - Apr 87
		6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s) Henry B. Dahms		8. CONTRACT OR GRANT NUMBER(s) NA
9. PERFORMING ORGANIZATION NAME AND ADDRESS HQ USAISC ATTN: AS-RM-SAI Fort Huachuca, AZ 85613-5000		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS NA
11. CONTROLLING OFFICE NAME AND ADDRESS HQ USAISC ATTN: AS-RM-SAI Fort Huachuca, AZ 85613-5000		12. REPORT DATE 7 Apr 87
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office) U.S. Army Finance & Accounting Center ATTN: SAFM-FAP-PT Indianapolis, IN 46249-0001		13. NUMBER OF PAGES 22 plus encl 35
		15. SECURITY CLASS. (of this report) U
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE
16. DISTRIBUTION STATEMENT (of this Report) Approved for public release; distribution unlimited.		
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from 16)		
18. SUPPLEMENTARY NOTES DA 312573		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number) (U) US (U) Communications (U) Management (U) Cost		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) The analysis recommends a methodology for certification of the monthly long distance telephone toll calls, and payment of a percentage of this bill to minimize late payment charges. Statistical sampling processes are explained that satisfy Public Law 88-521. Cost is used as an element of the sampling acceptance criteria. Stratification of charges or call duration provide additional cost-effective alternatives. Historical records provide the basis for on-time payment of most of the telephone bill.		

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TEST PROCEDURES FOR TOLL CALL CERTIFICATION ALTERNATIVES

1. **PURPOSE:** To present recommended procedures to be used in the evaluation of alternative approaches for certifying toll calls. The office of the comptroller of the Army (COA) requested that test procedures to evaluate an alternative to the current precertification of long-distance telephone bills be developed. (Reference letter, COA, DACA-FAP-PT, 22 Jul 86, Request for Establishment of Test Procedures.)

2. **BACKGROUND:** The House Appropriations Committee (HAC) requested proposals to change laws that will provide productivity improvement. COA proposed that a change be made to Title 31, United States Code Section 1348(b), to remove the requirement to precertify commercial long-distance telephone calls before payment. This proposal was not one of those presented to the HAC for consideration, but the COA directed that it be evaluated, even though its original purpose was not served. On advice of the JAG (encl 1), removal of the requirement to precertify before payment is illegal; therefore, the COA proposed procedures (that incorporated the elimination of the precertification requirement) could not be tested. In its place, the practice of paying on receipt the percentage of the bill representing the official calls, as given in the decision of the Comptroller General of the U.S. (Decision 217996) (encl 2), coupled with the application of statistical sampling methods, is proposed as the alternative to be evaluated.

3. TEST DESCRIPTION:

a. The testing of the certification process alternatives involves a cross section of CONUS installations, both with and without automated message accounting (AMA) equipment, and at large, medium, and small installations, namely, Fort Leonard Wood, Aberdeen Proving Ground, Sacramento Army Depot, Fort Riley, Fort Sheridan, and Fort Hood. Each of these installations was requested to provide information concerning current toll call certification workload and detection of unofficial telephone usage (encl 3). The percentages reflecting unofficial usage are so low that the sampling approach to certification is very attractive. It should be noted that these results differ significantly from the U. S. Army Audit Agency report (NE-86-4) referenced in your letter; the Office of the Inspector General DOD proposed audit report, project 51C-017 dated 7 Jul 86 (encl 4); and the results obtained in the study made by this office (encl 5). The explanation for this marked improvement is unknown at this time. The test series should confirm or question that progress has been made.

b. Each participating installation will:

(1) Implement the requirements contained in the draft of AR 25-7, Chapter 10 (appendix A).

(2) Pay on or just before the due date, the percentage of the toll call charges that are adjudged to be official based upon historical records, thereby limiting the late charges to those that are under investigation; then, pay for

(3) Stratify the toll calls listed in the monthly telephone bill into categories that require different levels of acceptability: Check higher cost calls on a 100% basis; disregard calls with insignificant charges; and certify the remaining calls on a sampling basis, if there are more than 150 calls in this category. Charges stem from a combination of duration of the call and the distance involved. It is recommended that call duration be used for categorization.

4. DATA REQUIREMENTS:

b. Certification experience during the test series. Provide, each month, the same data that is listed for the baseline period. Also describe each unofficial toll call, investigation findings, and corrective measures taken to preclude recurrence.

where $n_k p_k$ and n_k reflect historical data from the k th month.



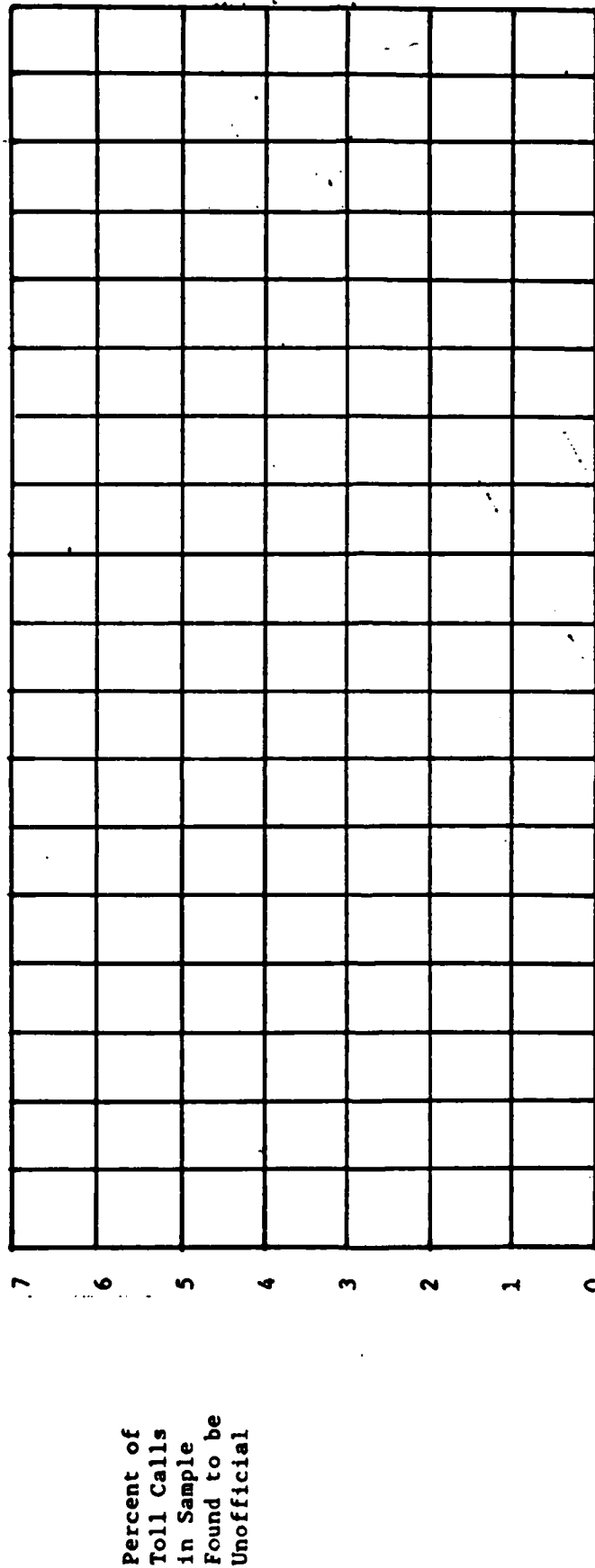
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Table 1 provides the UCL values for p' values of 0.001 through 0.100 and the sample sizes, n , for all sample sizes listed in appendix B. For example, if the percentage of unofficial toll calls during the baseline period of the previous 6 months is 5% ($p' = .050$), then the UCL for a sample of 125 is 10.8%, for a sample of 13 is 23.1%, etc.

d. Sampling plan usage and results. Present as part of the certification statement that authorizes payment of the telephone bill, a description of the sampling plan used and the results obtained to permit acceptance. If the plan resulted in rejection, describe the follow-up action taken.

e. Installations that are equipped with AMA have an opportunity to determine the unofficial use of other telephone systems by isolating questionable calls, such as, those made to unusual area codes and telephone numbers, calls made after hours, calls of extended duration, etc. Follow-up investigation of these suspicious calls may correct disciplinary problems and subsequently lead to reduced communication costs.

CONTROL CHART FOR MONTHLY PERCENTAGE OF UNOFFICIAL TOLL CALLS
MIL-STD-105D Single Sampling Plan with AQL of _____ %



Sampling Level I, II, III

Population Size:

Control Limit (UCL):

Sample Size (n):

Acceptance No. (AC):

Acceptance No. (AC):
Unofficial Calls (d):

Accept/Reject (A/R):

% Unofficial (d/n):

Table 1: Upper Control Limit (UCL) Percentages for Values of p' in the Range of 0.001 to 0.100 and MIL-STD-105D Sample Sizes up to 200.

VALUES OF UPPER CONTROL LIMITS (UCL)

P'	SAMPLE SIZE								
	3	5	8	13	20	50	80	125	200
0.001	5.6	4.3	3.5	2.7	2.2	1.4	1.2	0.9	0.8
0.002	7.9	6.2	4.9	3.9	3.2	2.1	1.7	1.4	1.1
0.003	9.8	7.6	6.1	4.9	4.0	2.6	2.1	1.8	1.5
0.004	11.3	8.9	7.1	5.7	4.6	3.1	2.5	2.1	1.7
0.005	12.7	10.0	8.0	6.4	5.2	3.5	2.9	2.4	2.0
0.006	14.0	11.0	8.8	7.0	5.8	3.9	3.2	2.7	2.2
0.007	15.1	11.9	9.5	7.6	6.3	4.2	3.5	2.9	2.5
0.008	16.2	12.8	10.2	8.2	6.8	4.6	3.8	3.2	2.7
0.009	17.3	13.6	10.9	8.8	7.2	4.9	4.1	3.4	2.9
0.010	18.2	14.3	11.6	9.3	7.7	5.2	4.3	3.7	3.1
0.011	19.2	15.1	12.2	9.8	8.1	5.5	4.6	3.9	3.3
0.012	20.1	15.8	12.7	10.3	8.5	5.8	4.9	4.1	3.5
0.013	20.9	16.5	13.3	10.7	8.9	6.1	5.1	4.3	3.7
0.014	21.7	17.2	13.9	11.2	9.3	6.4	5.3	4.6	3.9
0.015	22.6	17.8	14.4	11.6	9.7	6.7	5.6	4.8	4.1
0.016	23.3	18.4	14.9	12.0	10.0	6.9	5.8	5.0	4.3
0.017	24.1	19.0	15.4	12.5	10.4	7.2	6.0	5.2	4.4
0.018	24.8	19.6	15.9	12.9	10.7	7.4	6.3	5.4	4.6
0.019	25.5	20.2	16.4	13.3	11.1	7.7	6.5	5.6	4.8
0.020	26.2	20.8	16.8	13.6	11.4	7.9	6.7	5.8	5.0
0.021	26.9	21.3	17.3	14.0	11.7	8.2	6.9	5.9	5.1
0.022	27.6	21.9	17.8	14.4	12.0	8.4	7.1	6.1	5.3
0.023	28.3	22.4	18.2	14.8	12.4	8.7	7.3	6.3	5.5
0.024	28.9	22.9	18.6	15.1	12.7	8.9	7.5	6.5	5.6
0.025	29.5	23.4	19.1	15.5	13.0	9.1	7.7	6.7	5.8
0.026	30.2	24.0	19.5	15.8	13.3	9.4	7.9	6.9	6.0
0.027	30.8	24.4	19.9	16.2	13.6	9.6	8.1	7.0	6.1
0.028	31.4	24.9	20.3	16.5	13.9	9.8	8.3	7.2	6.3
0.029	32.0	25.4	20.7	16.9	14.2	10.0	8.5	7.4	6.5
0.030	32.5	25.9	21.1	17.2	14.4	10.2	8.7	7.6	6.6
0.031	33.1	26.4	21.5	17.5	14.7	10.5	8.9	7.8	6.8
0.032	33.7	26.8	21.9	17.8	15.0	10.7	9.1	7.9	6.9
0.033	34.2	27.3	22.2	18.2	15.3	10.9	9.3	8.1	7.1
0.034	34.8	27.7	22.6	18.5	15.6	11.1	9.5	8.3	7.2
0.035	35.3	28.2	23.0	18.8	15.8	11.3	9.7	8.4	7.4
0.036	35.9	28.6	23.4	19.1	16.1	11.5	9.8	8.6	7.6
0.037	36.4	29.0	23.7	19.4	16.4	11.7	10.0	8.8	7.7
0.038	36.9	29.5	24.1	19.7	16.6	11.9	10.2	8.9	7.9
0.039	37.4	29.9	24.4	20.0	16.9	12.1	10.4	9.1	8.0
0.040	37.9	30.3	24.8	20.3	17.1	12.3	10.6	9.3	8.2
0.041	38.4	30.7	25.1	20.6	17.4	12.5	10.8	9.4	8.3
0.042	38.9	31.1	25.5	20.9	17.7	12.7	10.9	9.6	8.5
0.043	39.4	31.5	25.8	21.2	17.9	12.9	11.1	9.7	8.6
0.044	39.9	31.9	26.2	21.5	18.2	13.1	11.3	9.9	8.8
0.045	40.4	32.3	26.5	21.7	18.4	13.3	11.5	10.1	8.9
0.046	40.9	32.7	26.8	22.0	18.7	13.5	11.6	10.2	9.0
0.047	41.4	33.1	27.1	22.3	18.9	13.7	11.8	10.4	9.2
0.048	41.8	33.5	27.5	22.6	19.1	13.9	12.0	10.5	9.3
0.049	42.3	33.9	27.8	22.9	19.4	14.1	12.1	10.7	9.5
0.050	42.7	34.2	28.1	23.1	19.6	14.2	12.3	10.8	9.6

VALUES OF UPPER CONTROL LIMITS (UCL)

P'	SAMPLE SIZE								
	3	5	8	13	20	50	80	125	200
0.051	43.2	34.6	28.4	23.4	19.9	14.4	12.5	11.0	9.8
0.052	43.7	35.0	28.7	23.7	20.1	14.6	12.6	11.2	9.9
0.053	44.1	35.4	29.1	23.9	20.3	14.8	12.8	11.3	10.1
0.054	44.5	35.7	29.4	24.2	20.6	15.0	13.0	11.5	10.2
0.055	45.0	36.1	29.7	24.5	20.8	15.2	13.1	11.6	10.3
0.056	45.4	36.4	30.0	24.7	21.0	15.4	13.3	11.8	10.5
0.057	45.9	36.8	30.3	25.0	21.3	15.5	13.5	11.9	10.6
0.058	46.3	37.2	30.6	25.2	21.5	15.7	13.6	12.1	10.8
0.059	46.7	37.5	30.9	25.5	21.7	15.9	13.8	12.2	10.9
0.060	47.1	37.9	31.2	25.8	21.9	16.1	14.0	12.4	11.0
0.061	47.6	38.2	31.5	26.0	22.2	16.3	14.1	12.5	11.2
0.062	48.0	38.6	31.8	26.3	22.4	16.4	14.3	12.7	11.3
0.063	48.4	38.9	32.1	26.5	22.6	16.6	14.4	12.8	11.5
0.064	48.8	39.2	32.4	26.8	22.8	16.8	14.6	13.0	11.6
0.065	49.2	39.6	32.6	27.0	23.0	17.0	14.8	13.1	11.7
0.066	49.6	39.9	32.9	27.3	23.3	17.1	14.9	13.3	11.9
0.067	50.0	40.2	33.2	27.5	23.5	17.3	15.1	13.4	12.0
0.068	50.4	40.6	33.5	27.7	23.7	17.5	15.2	13.6	12.1
0.069	50.8	40.9	33.8	28.0	23.9	17.7	15.4	13.7	12.3
0.070	51.2	41.2	34.1	28.2	24.1	17.8	15.6	13.8	12.4
0.071	51.6	41.6	34.3	28.5	24.3	18.0	15.7	14.0	12.5
0.072	52.0	41.9	34.6	28.7	24.5	18.2	15.9	14.1	12.7
0.073	52.4	42.2	34.9	28.9	24.8	18.3	16.0	14.3	12.8
0.074	52.7	42.5	35.2	29.2	25.0	18.5	16.2	14.4	13.0
0.075	53.1	42.8	35.4	29.4	25.2	18.7	16.3	14.6	13.1
0.076	53.5	43.2	35.7	29.6	25.4	18.8	16.5	14.7	13.2
0.077	53.9	43.5	36.0	29.9	25.6	19.0	16.6	14.9	13.4
0.078	54.2	43.8	36.2	30.1	25.8	19.2	16.8	15.0	13.5
0.079	54.6	44.1	36.5	30.3	26.0	19.3	16.9	15.1	13.6
0.080	55.0	44.4	36.8	30.6	26.2	19.5	17.1	15.3	13.8
0.081	55.4	44.7	37.0	30.8	26.4	19.7	17.3	15.4	13.9
0.082	55.7	45.0	37.3	31.0	26.6	19.8	17.4	15.6	14.0
0.083	56.1	45.3	37.6	31.3	26.8	20.0	17.6	15.7	14.2
0.084	56.4	45.6	37.8	31.5	27.0	20.2	17.7	15.8	14.3
0.085	56.8	45.9	38.1	31.7	27.2	20.3	17.9	16.0	14.4
0.086	57.2	46.2	38.3	31.9	27.4	20.5	18.0	16.1	14.5
0.087	57.5	46.5	38.6	32.2	27.6	20.7	18.2	16.3	14.7
0.088	57.9	46.8	38.8	32.4	27.8	20.8	18.3	16.4	14.8
0.089	58.2	47.1	39.1	32.6	28.0	21.0	18.5	16.5	14.9
0.090	58.6	47.4	39.4	32.8	28.2	21.1	18.6	16.7	15.1
0.091	58.9	47.7	39.6	33.0	28.4	21.3	18.7	16.8	15.2
0.092	59.3	48.0	39.9	33.2	28.6	21.5	18.9	17.0	15.3
0.093	59.6	48.3	40.1	33.5	28.8	21.6	19.0	17.1	15.5
0.094	59.9	48.6	40.4	33.7	29.0	21.8	19.2	17.2	15.6
0.095	60.3	48.8	40.6	33.9	29.2	21.9	19.3	17.4	15.7
0.096	60.6	49.1	40.8	34.1	29.4	22.1	19.5	17.5	15.8
0.097	61.0	49.4	41.1	34.3	29.6	22.3	19.6	17.6	16.0
0.098	61.3	49.7	41.3	34.5	29.7	22.4	19.8	17.8	16.1
0.099	61.6	50.0	41.6	34.8	29.9	22.6	19.9	17.9	16.2
0.100	62.0	50.2	41.8	35.0	30.1	22.7	20.1	18.0	16.4

APPENDIX A

DRAFT

ARMY REGULATION 25-7

Installation Information Services

Chapter 10

Certification of Telephone Toll Calls

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Chap 10

10-11 Certification of Telephone Toll Calls

a. The installation commander/DOIM will prepare a certification program for the installation or activity supported. Where the certification has MACOM-wide application, as in the recruiting command, the DCIM/DOIM may perform this function. Such a program:

(1) Should be based on classes of certification which are related to the degree of unrestricted access to commercial long distance calling (and are therefore relative to the potential for abuse).

(2) Should be concerned with overall economy and discipline vice a singular focus on long distance commercial calling.

(3) Should have the flexibility to use automation and call detail recording to their best advantage as a source of management information and internal control.

(4) Should be localized to accommodate technical, organizational, or geographic characteristics of the activity where certification occurs.

(5) Should be discretionary (within class of certification and level of approval).

(6) Should encourage a more centralized, economical certification process; one that can reasonably occur at the supporting ~~C-E~~ ^{DOIM} officer level based on periodic contact with telephone control officers for the organizations supported.

(7) Should be well documented IAW the format described below and subject to periodic review.

b. SCOPE. The telecommunications certification program serves to:

(1) Provide an internal and operational plan for telecommunications economy and discipline.

(2) Provide the policy and procedures for the verification/certification of telecommunications expenses to be officially certified for payment on SF 1034, Public Voucher for Purchases and Services Other than Personal.

c. The certification program should consist of four levels of review. Requirements to develop and maintain sufficient inventory data to review common-user telecommunications requirements, call detail, traffic management, and for bill verification are used in conjunction with the certification

program.

(1) For each installation or activity, individualized procedures will be developed and documents for all levels of review in the certification program. These levels are:

LEVEL	RESPONSIBLE PARTY	WHEN PERFORMED
Basic Certification	TCO	Continuous
Performance Certification	DOIM or Designee	Per Telecom- munications Bill
Secondary Certification	DOIM or Designee	Periodic
Remedial Certification	TCO and DOIM	As required

(2) Basic, performance, and secondary certification review levels are mandatory. Remedial certification is performed when abuse is judged excessive. Excessive abuse is decided on the basis of usage indicators and other factors which are discussed below.

e. PROCEDURES. Certain procedures are required for each level of certification. The minimum requirements are provided below for an appropriate certification program to include compliance with the statutory requirements of 31 U.S. Code 1348(b). More detailed or stringent procedures may be imposed by the supporting DOIM who develops the local certification program. Also, inspection or compliance reviews by either USAISC or supported MACOM may change these procedures, if compliance is not satisfactory.

f. BASIC CERTIFICATION. Basic certification is the acknowledgment that toll and other long distance calls are made in the interest of government.

(1) Basic certification should occur within the organization where the long distance call was placed or accepted (in the case of third party and collect calls). The organization's own official telephone-related records or those prescribed by the certification program are the basis for certification of all long distance calls. The organization TCO will immediately report all unofficial or unauthorized calls to the supporting DOIM, or his designated representative.

(2) Unless otherwise required in the certification program, the remaining calls-with the exception of billing errors detected during performance certification-are certified as they occur at the organizational level. During the preparation of the

SF 1034, these calls will be subsequently and automatically certified by the supporting DOIM or his designated representative.

(3) The following areas will be addressed by the USAISC representative for the development of BASIC CERTIFICATION procedures. These procedures will be documented in the approved telecommunications certification program for the installation, facility, or region:

(a) Determine call detail reporting requirements.

1. Call detail reports can include all telephone calls or data transmissions placed through the administrative telephone system of the facility. These calls include local and long distance commercial telephone calls, such as toll, message unit, directory assistance, Wide Area Telecommunications Service (WATS), or other bulk-service calls. Also included are value-added carrier, Federal Telecommunications Service, AUTOVON, foreign exchange, and private line calls. In general, any call that can be recorded on automatic message accounting (AMA) or station message detail recording (SMDR) equipment is eligible for call detail reporting. This reporting is the basis for required review and certification by the customer organization placing or accepting charges (of any type) for the call.

2. The choice of calls to be reported is based on the availability of SMDR/AMA equipment and reports processing support, the likelihood of abuse as determined in paragraph h (1) (c) under SECONDARY CERTIFICATION, and installation/command sampling plans. The minimum allowable detail is a sample of toll calls found on commercial telephone bills.

3. Each item of call detail will include the telephone number or extension from which the call was placed in the customer's organization, the date of the call, its duration, and the complete telephone number, including the area code and exchange of the number called. Where possible, as is the case with most commercial billings, the plain English identification of the city and state of the called number will also be provided. Similar information will be provided for third party or collect calls accepted by the organization.

4. Within type of calling, the selection of call detail items can be grouped between routine and high potential abuse type calls as determined under SECONDARY CERTIFICATION. Routine calls can be sampled IAW the installation/command sampling plan while high potential calls will normally be reviewed and certified on a 100% basis.

5. Call detail reporting will also be used to report

call information from telephone toll tickets (DD Form 1194) or similar records prepared by installation or facility PBX operators. Reports will be provided to customer organizations of selected overseas AUTOVON calls, offnet AUTOVON calls, and commercial toll calls not already reported above. Toll tickets may occasionally be used to record unofficial (class B) commercial calls, unauthorized AUTOVON calls, or other operator connected calls for which charges are calculated. In these cases, toll tickets will be the basis for FAO billing and collection for the sale of unofficial communications services.

(b) Distribute call detail.

1. Call detail reports are to be distributed in a prompt manner so that customer organizations have sufficient time to review and certify selected call detail items.

2. The minimum required time period is 5 working days for commercial telephone calls. This period normally ends with the release of the SF 1034, Public Voucher for Purchases or Services Other Than Personal. This voucher is for payment of an accompanying telephone bill. Part or all of the call detail being reviewed by the customer must correspond to the telephone calling on such bills.

3. The USAISC office may make telephonic or electronic inquiries within the customer organization. These inquiries are to check the validity of sampled calls-"Were the following calls made for official purposes on the date of...?" Inquiries will be directed to Telecommunications Control Offices detail reports. Where the USAISC officer deems appropriate, this procedure is used to speed the certification process and thereby avoid the payment of interest penalties under the Prompt Payment Act.

4. With assured distribution of call detail reports, standing suspenses may be used to routinely report unofficial calls made during certain billing periods. Within customer organizations, the efficiency of standing suspense systems to report all unofficial calls on a timely basis will be verified periodically under SECONDARY CERTIFICATION procedures.

(c) Review and certification.

1. Review and certification at the customer organization is based on continuous internal control procedures. The purpose of these procedures is to encourage the economical and efficient use of the administrative telephone system and to limit its use to official calling by employees within the customer organization. Procedures are described in terms of responsibilities and duties for employees and TCOs within that organization.

2. Internal control procedures are based on locally-developed guidance, including customer organization input from the Telecommunications Control Board, and are established in the approved telecommunications certification program.

3. Specific controls could be based on existing administrative processes within the organization and may include written or electronically maintained telephone logs, contact reports, DA Forms 360, DA Forms 1194, or other acceptable records. Where feasible, controls will be transparent to the user and automatic. These types of controls include the use of personnel access codes, individualized call detail reports, and least cost routing. The information collected for subsequent validation against call detail report should approximate that found on the detail reports as described in paragraph (3)(a)3 above.

4. The SF 1034 is released by the USAISC office on the basis of internal control procedures practiced by customer organizations. Written or electronic records within the customer organization and the validations made against them will be made available at the request of USAISC representatives for periodic verification.

(d) Call investigation. The review and certification performed by customer organizations as a result of call detail reports and the organizations own internal controls may identify three types of calls:

- Calls certified as being made or accepted for official purposes;

- Calls declared unofficial with the caller identified for subsequent billing or with the organizations accepting responsibility for the call; and/or

- Calls that are uncertified.

Call investigation will occur for unofficial and uncertified calls. The investigations will determine who is responsible for payment of the call, administrative charges as addressed below, and may form the basis for subsequent disciplinary action.

1. Unofficial calls may represent an erroneous or abusive use of the administrative telephone system. The assessment of the administrative charge for unofficial/unauthorized toll calls will be IAW the approved telecommunications certification program to include local procedural changes made as a result of union negotiations.

2. Uncertified calls require additional information

before they can be determined official or unofficial. After sufficient internal investigation, calls that remain uncertified, will be referred to the servicing telephone company or communications contractor. A record will be made of all calls that remain uncertified and their disposition. Such dispositions include: Acceptance by the contractor as a billing error, acceptance by the government for payment, or acceptance by an organization for individual investigation and subsequent action. Customer organizations having excessively high numbers of uncertified calls will be subject to REMEDIAL CERTIFICATION procedures as described in paragraph i below. Other measures may be used to curb abuse or ensure positive internal control. These include restrictions on long distance calling, the use of telephone control numbers, operator interventions for designated extensions, DA Forms 360 enforcement for all types of calling, and other measures described in the approved telecommunications certification program.

g. PERFORMANCE CERTIFICATION. Performance certification is the systematic verification of bill-related charges for authorized telecommunications services performed by a contractor to include changes in service or equipment. It is required to avoid overpayment by the government and to verify a commercial communications bill as being correct and payable.

(1) Performance certification is based on a manual or automated inventory of telecommunications resources, adjustments to the inventory as a result of documents authorizing change, completion reports, and billing review and verification. The beginning inventory is the result of the annual revalidation of telecommunications resource required in AR 105-10. Change documents include the Communication Service Authorization (CSA), DD Form 428, the Commercial Communications Work Order (CCWO), DD Form 1367, and/or other locally required documents. Completion reports include those provided by the contractor or telephone company and those required as a part of the certification program.

(2) The major elements of performance certification are:

(a) Review changes to the telecommunications inventory. The bill is reviewed for local service and equipment charges and is compared to the CSA (DA Form 428) or other prescribed documentation to ensure that they are correct with respect to:

1. Recurring charges on trunks, tie lines, switchboard room, and terminal room equipment.

2. Charges on PBX stations and extensions, miscellaneous equipment, and any other equipment authorized on a

maximum limit basis.

3. Charges for installation, deinstallation or maintenance-related authorized changes.

(b) Review Message Unit Charges.

1. A continuing month-by-month record will be maintained on message unit charges in order that the trend may be monitored. Sharp increases/decreases (as defined in the certification program) of the number of message units used will be investigated with the telephone company and corrective action taken.

2. Additional local message unit charges will show the number and cost of additional message units used beyond the allowance included in the monthly charge of trunks. The total cost of message units for interzone messages normally will be billed separately and appropriately designated; however, separate listings of each message unit call is permissible as may be arranged with the telephone company.

(c) Review Telephone Toll Service Charges.

1. Supporting evidence for toll charges may be presented by the telephone company in three ways:

--By the telephone company toll ticket or mark sense card originals.

--By a commercial statement listing in chronological order the toll calls charged to the PBX number.

--By a listing of the toll calls charged to individual PBX extensions or code numbers assigned thereto.

2. Select at random approximately 10 percent, but not less than 25 in number, of the billed calls. Check the accuracy of the billed computations by totaling the charges listed on the telephone company toll statements, and compare the toll tickets or other prescribed documentation on toll calls with the bill. On any point that disagrees, the telephone company will be requested to check the call.

3. If the number of discrepancies between the selected billed calls and the corresponding toll tickets or other documentation exceeds a target percentage (designated in certification program) of the total number of billed items selected for spot check, all billed calls will be checked. Otherwise, periodic basis by the supporting C-E officer or his designated representative.

(1) The purposes of secondary certification are:

--To verify telecommunication internal control procedures for support organizations.

--To provide reports to support the accuracy of both basic and performance certification.

(2) Each organization will be reviewed at least quarterly for secondary certification. The review consists of one or more of four optional procedures. In the case of fraudulent or excessive abuse, discovered as a result of these procedures, remedial certification described below will be instituted by the supporting C-E officer.

(3) The guidelines for at least four optional procedures are provided below. The particular procedure to be used for an organization will depend on past performance, available resources, degree of automated support, and class of certification (discussed in paragraph f). Procedures may be used alone or interactively. Minimally, secondary certification procedures will include:

(a) Onsite Review. The organization's official SOPs, telephone call-related records, or other documentation required by the certification program will be analyzed with corresponding telephone bills.

(b) Telecommunications Resource Review. The max limit. CSA and the organization's basis of issue, or other authorization documents as required, will be compared with actual equipment and service. This review can be used to partially satisfy the annual review and revalidation required in AR 105-10.

(c) Review of Usage Indicators.

1. These indicators allow a month-by-month comparison of telecommunications usage, cost, grade of service, or other criteria. Indicators are established on the basis of current and historical local data and are documented in the certification program. Local data is gathered during performance and secondary certifications. Ultimately, good usage indicators should provide the supporting C-E officer or his designee the ability to segregate mission-related increases in telecommunications from those usage patterns requiring communications economy and discipline.

2. Population served, lines-in-service, grade of service, number of calls, cost-per-call, cost-per-minute, average-length-of-call, cost-per-bill or segment thereof (per line, per user organization, per type service, etc.) and other

factors, depending upon their availability, can be used as usage indicators.

3. The method of analysis used to review these indicators, summary reports available as a result of their use, location of reports, and the personnel responsible for maintaining them, should be addressed in the certification program.

(d) High Potential Review. This procedure requires the selective verification of commercial long distance calls having a high potential for being fraudulent or abusive. High potential calls can include:

1. Calls over 10 minutes long.

2. Calls repeatedly made to the same location in the same or separate billing periods.

3. Calls to unlikely or abnormal locations.

4. Collect and third party calls, especially where the organization's mission does not support such calls.

5. Calls made after working hours and during lunch and lightly populated flextime periods.

- a. Selective verification will result in a special report to the organization making such calls. Special reports can be produced by automated call detail analysis or manually.

- b. A log will be maintained of who received the report, the date provided, and follow-up actions taken.

- i. REMEDIAL CERTIFICATION. This process is required when abuse is judged excessive or potentially high on an organization-by-organization basis. As necessary, it can be applied to the entire installation or activity. Remedial certification can also be instituted where basic certification is not performed IAW the locally required certification program.

- (1) Remedial certification can include DA Form 360 item-by-item examinations, the use of continuous secondary certification procedures, frequent onsite inspections, and other actions as documented in the certification program.

- (2) Remedial certification will remain in effect until adequate basic certification is reestablished by the organization where abuse was considered excessive.

- j. DOCUMENTATION AND REPORTING REQUIREMENTS. The

installation, activity, or MACOM-level certification program should be documented in accordance with the standard format described below. Additionally, an annual summary of the certification program is required in the Telecommunications Economy And Discipline Report (RCS CC-54) in AR 105-10.

(1) Documentation Requirements. The certification program should be clearly and consistently documented. The procedures used to implement its policy requirements must be detailed and understandable. Any SOPs developed for the program should be attached. Where SOPs must be developed by participating organizations sample guidelines are recommended. The format below outlines minimum subject areas to be documented in the program:

SUBJECT	CONTENT
Policy	The management position regarding certification of long distance calls by supported organizations
Scope	Who is required to follow the program of the organizations present at the installation, activity, or on a MACOM-wide basis, where appropriate.
Responsibilities	Identify who is responsible for approval, execution, and review of the certification program.
Constraints	Limitations regarding the administration or execution of the program.
Overview	Describe how the program is intended to work generally.
Class of Certification	Indicate class of certification IAW this regulation. Where required, allow space to cross-reference the document granting program approval.
Procedures	Detail the procedures for each level of certification as outlined below.
Basic Certification	Describe procedures. If organizations must develop SOPs indicate format, and where possible a sample SOP.

State who in the supported organization is responsible for the control and identification of telephone control officers. If the supporting DOIM is responsible for these actions, describe internal control procedures.

Where necessary indicate specialized certification requirements levied on particular organizations. For example, the responsibility for otherwise unidentified collect calls accepted at phones within their operational control may be described here.

Performance Certification

Describe inventory, service ordering and completion, and bill verification internal control procedures. Describe sampling method and target percentages where applicable.

Secondary Certification

Describe specific procedures for each of the review options in paragraph h. Include additional options specifically developed for the program.

Remedial Certification

Describe procedures required, basis for their being required, and follow-up actions required for their removal.

k. APPROVAL OF THE CERTIFICATION PROGRAM. The certification program is approved at two levels depending on its classification. The first level is local, where required approval is by the installation or activity commander. The second level is for regulatory compliance and depends on the classification of subscriber access to commercial dialing and long distance calling generally. Each class is related to the degree of unrestricted access available to the general subscriber, and consequently the potential for telephone abuse and unofficial/unauthorized use. These classes are:

CLASS	APPROVAL	DESCRIPTION
I	Supporting C-E Officer	Total operator-restricted access to long distance calling for all subscribers.

- II Major Subordinate Command (USAISC) Machine-restricted access to long distance calling. Includes least cost routing supplied access to DDD, WATS, and FTS.
- III Major Subordinate Command (USAISC) Unrestricted access to long distance calling. The certification program is applicable to monthly commercial communications bills of less than \$100,000.
- HQ USAISC Unrestricted access to long distance calling. The certification program is applicable to monthly commercial communications bills of more than \$100,000.

APPENDIX B

CERTIFICATION OF COMMERCIAL LONG-DISTANCE TELEPHONE CALLS BY SAMPLING

1. **INTRODUCTION.** Public Law 88-521 authorizes sampling methods to facilitate the certification of vouchers provided that the sampling procedures are in conformance with GAO Policy and Procedures Manual, title 3, chapter 10. Cost savings and other benefits accrue when sampling operations are adopted provided that there is a significant quantity to be reviewed and sufficient management control exists to justify the risks associated with sampling operations. But to institute and continue the sampling program, it is necessary to issue instructions, indoctrinate personnel, and document results and follow-up action.

2. **SAMPLING OPERATIONS.** The sequence of steps used when applying acceptance sampling techniques is as follows:

- a. Establish the population that will be sampled and will be certified if the sample meets the acceptance criteria of the sampling plan.
- b. Select the required number of toll call samples from the population such that they are unbiased representatives of the population.
- c. Review each sampled toll call to determine if it is official or not IWA the definitions used and locally established certification procedures.
- d. Compare the results obtained in the audit of the sampled toll calls with the acceptance criteria of the sampling plan and take the appropriate action. If the criteria is met, certify the remaining population of toll calls, but perform necessary follow-up of any problem toll calls found in the sample. If the criteria is not met, refer the toll call population that fails the sampling acceptance criteria to the individual responsible for certifying the calls, for guidance. The next action can range from 100% screening of the remaining toll calls to follow-up of only those areas where problems were detected. In any case, follow-up is required for all observed problems to initiate corrective action.
- e. Establish the acceptance criteria for the next month's telephone bill as illustrated in appendix C.

3. **SAMPLING PLANS.** DOD recommends the attributes sampling plans and procedures of MIL-STD-105D, but other types and variations may be used with proper approval. Attribute plans are those in which a sampled item is either good or bad, e.g. the toll call is either official or it is not.

- a. The protection afforded by a sampling plan is specified by the Acceptance Quality Level (AQL). For example, if it is allowable that up to about 7 percent of the toll call listing can be unofficial, then the sampling plan with an AQL of 2.5% should be used. This recommendation is made by

interpreting the Operating Characteristic (OC) curve for the 2.5% AQL sampling plans. The 1.5% AQL sampling plans allow about 4 percent of the tolls call to remain in populations accepted by sampling; the AQL of 4.0% allows about 9 percent.

b. Three levels of sampling plans are available in MIL-STD-105D: Tightened, Normal, and Reduced. The Normal Level is used when sampling methods are introduced. After a succession of "accept" decisions are made at this Level, greater risks can be taken, and the sampling program moves to the Reduced Level. If a "reject" decision is made, the next month's toll calls are subject to the Tightened Level. Then, after a succession of "accept" decisions are made at this Level, the sampling program returns to the Normal Level.

c. MIL-STD-105D attribute single sampling plans for AQLs of 1.5%, 2.5%, and 4.0% are shown below as they apply to population sizes of 151 to 3200, where n = sample size, AC = acceptance number, RE = rejection number.

Number of Toll Calls in Population	Sampling Level	Acceptance Quality Level (AQL)								
		1.5%			2.5%			4.0%		
		n	AC	RE	n	AC	RE	n	AC	RE
151-280	Reduced*	3	0	1	8	0	2	5	0	2
	Normal	32	1	2	32	2	3	32	3	4
	Tightened	50	1	2	50	2	3	50	3	4
281-500	Reduced*	13	0	2	8	0	2	8	1	3
	Normal	50	2	3	50	3	4	50	5	6
	Tightened	80	2	3	80	3	4	80	5	6
501-1200	Reduced*	13	0	2	13	1	3	13	1	4
	Normal	80	3	4	80	5	6	80	7	8
	Tightened	125	3	4	125	5	6	125	8	9
1201-3200	Reduced*	20	1	3	20	1	4	20	2	5
	Normal	125	5	6	125	7	8	125	10	11
	Tightened	200	5	6	200	8	9	200	12	13

*If the AC is exceeded, but the RE has not been reached, accept the toll call population, but reinstate Normal Level sampling plan on the next month's population.

d. General sampling procedure. Reference the sampling table excerpt in paragraph 3.c. and the illustrative example given in appendix C.

(1) Randomly select a representative sample of size "n" from the population. (If the toll call listing to be sampled contains about 850 entries and the Normal Level applies, select a sample of 80 entries.)

(2) If the number of questionable calls in the sample of "n" does not exceed the quantity "AC", certify the population. If the number of questionable calls in the sample equals or exceeds the quantity of "RE", hold the population for disposition because the population cannot be certified on a sampling basis. (If in the example, a total of 5 questionable calls is detected, population acceptance depends upon the standard for acceptance as

given by the AQL: For an AQL of 2.5% or 4.0%, the population would be certified on a sampling basis; but for an AQL of 1.5%, the population could not be certified on a sampling basis.)

(3) Next month's certification process depends upon the results obtained in the current month's sampling "accept" or "reject" decision. If an accept decision is reached, the following month can be sampled at the same level as before, or, if this is the last of "k" successive accept decisions, the following month may be sampled at a less stringent level of sampling, where the value "k" is defined in the sampling plan as the criteria for admission to that level. If a reject decision is reached, the following month must be sampled at a the Tightened Level. (Also note that it is possible to change to a Normal Level from the Reduced Level if the reject decision is not reached but only a provisional acceptance decision is possible, as noted in the sampling table.)

(4) Investigate all questionable toll calls. The fact that a toll call is later found to be definitely official in nature does not change the acceptance criteria decision of the sampling plan. If the individual responsible for an unofficial call can be identified, appropriate follow-up action should be taken and documented to prevent recurrence, so that sampling operations can have a better chance of continuing.

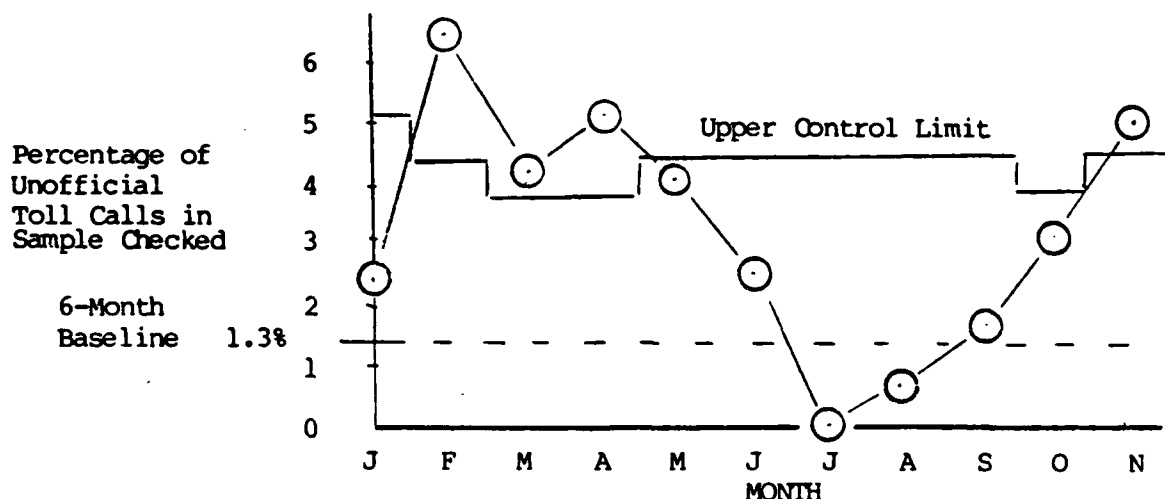
(5) The cost of a call may be introduced into the criteria for acceptance to limit the undetected unofficial call charges in the bills that are certified by sampling methods. Define a given dollar amount as a major unofficial call. Combine the dollar values of all of the unofficial calls found in the sample to establish an equivalent number of major unofficial calls. Then compare the number of major unofficial calls to the sampling plan acceptance criteria. For example, if the standard of \$5.00 per toll call defines a major unofficial call, and the total of the toll call charges on 8 calls is \$53.21, then a total of 10 major unofficial calls is formed to be compared with the sampling plan acceptance criteria; if the charges are \$19.25, then there is a total of only 3 major unofficial calls.

4. RECOMMENDED SAMPLING PLAN PARAMETERS:

- a. MIL-STD-105D single sampling plan with AQL of 2.5%.
- b. Successive "accept" decisions to proceed from the Tightened Level to the Normal Level, and from the Normal Level to the Reduced Level: 6 (which corresponds to 6 months).
- c. Population definition: The toll calls with from 10 to 30 minutes duration.
- d. Acceptance criteria: Determine if the population can be certified on a sampling basis by using equivalent major unofficial calls to compare with the sampling plan accept or reject values. Define a major unofficial call as an equivalent call with a charge of \$10.00. This value should reflect the average charge experienced for a toll call of 20 minutes, the median of the range of 10 to 30 minutes duration. If \$10.00 does not meet this condition, it should be corrected to reflect the historical information of the installation.

APPENDIX C

EXAMPLE OF A CONTROL CHART FOR MONITORING TOLL CALL SAMPLING RESULTS MIL-STD-105D Single Sampling with AQL of 2.5%



Sampling Level*:	II	II	III	III	III	III	III	III	III	III	II
Population Size:	1002	1251	1496	2240	784	1104	952	882	1059	1465	1326
Control Limit (UCL):	5.1	4.3	3.7	3.7	4.3	4.3	4.3	4.3	4.3	3.7	4.3
Sample Size (n):	80	125	200	200	125	125	125	125	125	200	125
Acceptance No. (AC):	5	7	8	8	5	5	5	5	5	8	7
Unofficial Calls (d):	2	8	8	10	5	3	0	1	2	6	6
Accept (A)/Reject (R):	A	R	A	R	A	A	A	A	A	A	A
% Unofficial (d/n):	2.5	6.4	4.0	5.0	4.0	2.4	0.0	0.6	1.6	3.0	4.8

Notes (See below): 1 2 3 4 5 6 7

* Levels: I = Reduced; II = Normal; III = Tightened.

- Notes:
1. Start sampling program at the Normal Level.
 2. Population size requires larger sample size. Unofficial calls found in the sample exceed the acceptance number, population cannot be accepted on a sampling basis. Following month requires sampling at the Tightened Level.
 3. Sample size and acceptance number are established by the Tightened Level. UCL exceeded again to indicate need for continued corrective action; there is a significant difference from the baseline fraction defective established for the installation.
 4. Unofficial calls found in sample exceed acceptance number again. Continue the Tightened Level next month and until 6 successive months are accepted on a sampling basis.
 5. Population size requires smaller sample size.
 6. Population size requires larger sample size. Next month the sampling can return to the Normal Level because this is the 6th successive month that sampling methods accepted the population.
 7. Population is certified on a sampling basis, but the upper limit was exceeded to signal significant difference from the standard established for the installation.

Computation of the historical percentage in the example:

Total toll calls in previous 6 months:	6731
Total unofficial toll calls detected:	89

$$p' = 89/6731 = 0.013 \text{ (or 1.3\%)}$$

Computation of the upper control limit (UCL) for the example:

$$\begin{aligned} \text{UCL} &= p' + 3 \sqrt{(p')(1 - p')/n} \\ &= 0.013 + 3 \sqrt{(0.013)(1 - 0.013)/n} \\ &= 0.013 + (0.33982)/(\sqrt{n}) \\ &= 0.013 + (0.33982)(0.11180) = 5.1\%, \text{ for } n = 80 \\ &= 0.013 + (0.33982)(0.08944) = 4.3\%, \text{ for } n = 125 \\ &= 0.013 + (0.33982)(0.07071) = 3.7\%, \text{ for } n = 200 \end{aligned}$$

Toll Call Certification by Statistical Sampling Methods

1. INTRODUCTION. AR 105-23 establishes that toll calls must be certified that they are in the interest of the government, prior to the payment of the monthly toll call bill. Public Law 88-521 authorizes sampling methods to facilitate this certification process, provided that the sampling procedures are in conformance with GAO Policy and Procedures Manual, title 3, chapter 10. A survey of toll call certification practices and experience at typical Army installations/activities was made to examine the practicality of the sampling approach. It is evident that some installations/activities exercise sufficient management control to justify the risks associated with sampling operations. Cost savings and other benefits accrue when sampling operations are adopted, but along with these advantages come the requirements for special instructions, indoctrination, and supporting documentation.

2. CURRENT CERTIFICATION OPERATIONS.

a. Sources:

(1) With the cooperation of the 7th Signal Command, detailed information on the toll call certification workload, costs, usage abuse, and procedures was requested from 10 Army installations and from the recruiting command. These Army installations were selected because they appear to be a cross section of toll call activity based upon 1983 toll call costs throughout CONUS. Data was readily available at six sites, as reflected in their prompt and complete response. Table 2-1 represents the information provided. Bayonne was unable to provide requested information because an on-site Call Detail Recording (CDR) system was being installed and cutover in the period of time indicated. The Presidio at San Francisco phoned that the data requested was not readily available from their monthly bill which had some 4,000 pages; they were excused from participation. Fort Lewis and St. Louis DMATS made no response. A trip was made to Fort Sheridan at their invitation to gain insight into the special problems and conditions that characterize the certification operations within the recruiting command. The analysis of the data obtained provides a basis for understanding how sampling methods might impact Army toll call certification operations.

(2) Data provided from Fort Ritchie, relating to the administrative charges for unofficial/unauthorized telephone toll calls, was used also in this study. The report includes the number of toll calls and unofficial/unauthorized toll calls during 1983 from Tobyhanna, Hawthorne, Rock Island, and Fort Ritchie, as listed in table 2-1.

(3) RETAM data includes toll call costs throughout CONUS Army installations during 1983. This cost information is plotted in a frequency histogram, figure 2-1, for 85 installations. The 1983 costs for the 10 locations listed do span the full range of installation toll call costs.

Command Location	TRADOC Fort Belvoir	OPSCOM West Point	AMC White Sands	FORSCOM Fort Hood	TRADOC Fort Dix	AMC Jefferson PG	AMC Tobyhanna	AMC Hawthorne	AMC Rock Island	NTMC Fort Ritchie	Totals
Time Period	•	•	•	•	•	•	• 1983	1983	1983	1983	••
Total Toll Calls	3000	205475	89418	50160	3366	1023	600	409	12038	1656	363209
AV Toll Calls per Month	1500	34246	14736	8360	561	172	50	34	1008	138	754592
Total Toll Call Cost (\$)	629367	298103	296593	42413	10405	1573	3556	106	91677	20160	754592
AV Cost per Toll Call (\$)	63.82	1.45	3.24	0.85	3.03	1.53	5.93	0.26	7.58	12.17	2.08
Number of Unofficial Calls	475	2053	4622	300	343	23	1	24	6	36	7474 ***
Percent Unofficial	5.28	1.00	5.23	0.60	10.19	2.82	0.17	5.88	0.05	5.80	27233
Cost of Unofficial Calls (\$)	3000	5362	15314	3460	1852	45	0.00	0.00	0.00	0.00	3.64 ***
AV Cost per Unoff Call (\$)	6.32	2.30	3.44	11.53	5.40	1.55	0.00	0.00	0.00	0.00	2637
Number of Unknown Calls	450	1231	898	217	291	0	0.00	0.00	0.00	0.00	10538
Percent Unknown	5.00	0.60	1.02	0.43	8.65	0.00	0.00	0.00	0.00	0.00	4.02
Cost of Unknown Calls (\$)	2300	3577	3603	1908	1504	0	0.00	0.00	0.00	0.00	10538
AV Cost per Unknown Call (\$)	6.44	2.91	4.02	8.79	5.17	0	0.00	0.00	0.00	0.00	4.02

• 6-Months April/September 1984.

•• Omits Fort Belvoir data as non-representative because toll calls involve mostly data transmission and overseas calls.

*** Unofficial toll calls were estimated to be one percent of the toll calls at West Point.

Table 2-1. Toll Call Frequency, Costs, and misuse at typical Army Installations.

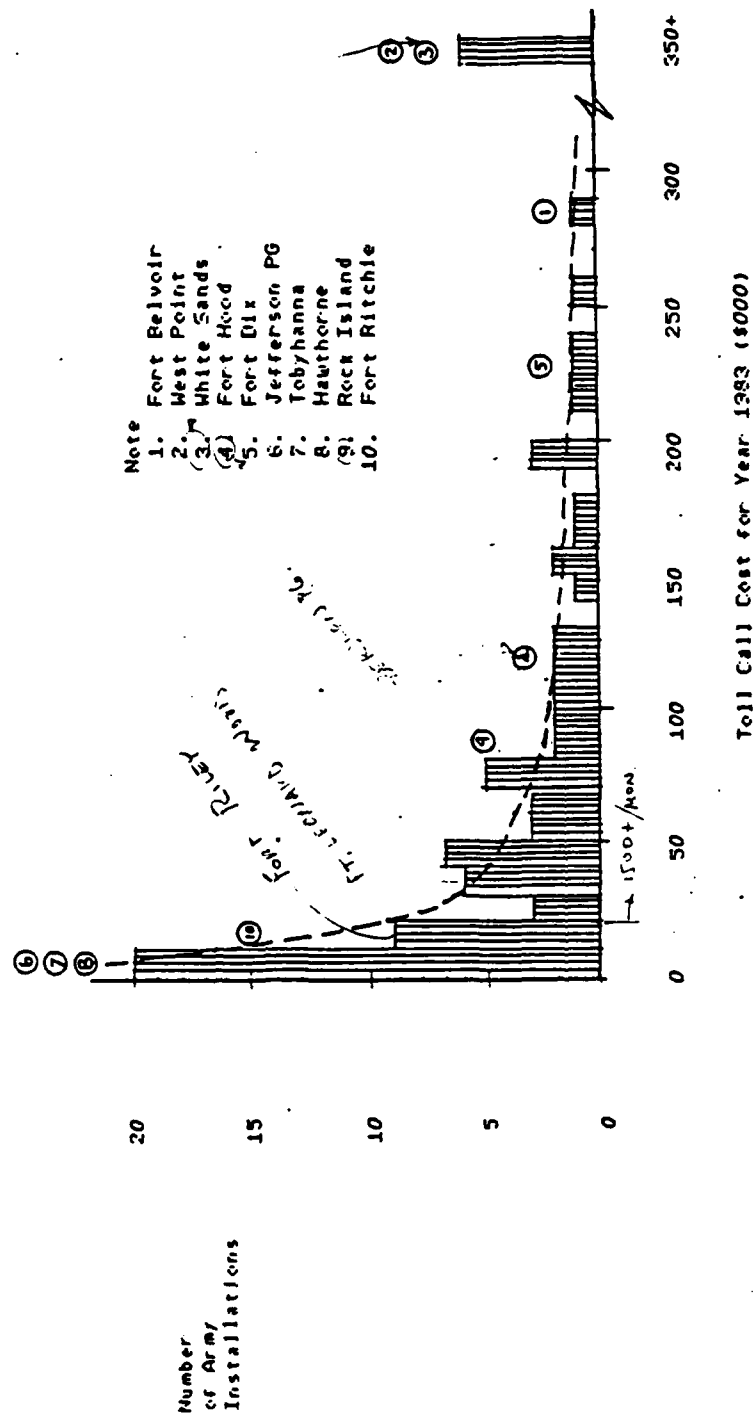


Figure 2-1

(4) The recruiting command encompasses an organization of 5 brigades with 56 battalions, 259 companies, and 1,500 full-time and part-time stations where almost all of the communications outside of the immediate geographical area are toll calls. The structure of this command is shown in figure 2-2. The toll call cost information for the year ending 30 Sep 84 is plotted in a frequency histogram, figure 2-3, for 55 battalions. The number of toll calls represented by these costs was estimated. Unofficial toll call occurrence was largely unknown, except for the findings documented in audit reports.

b. Workload.

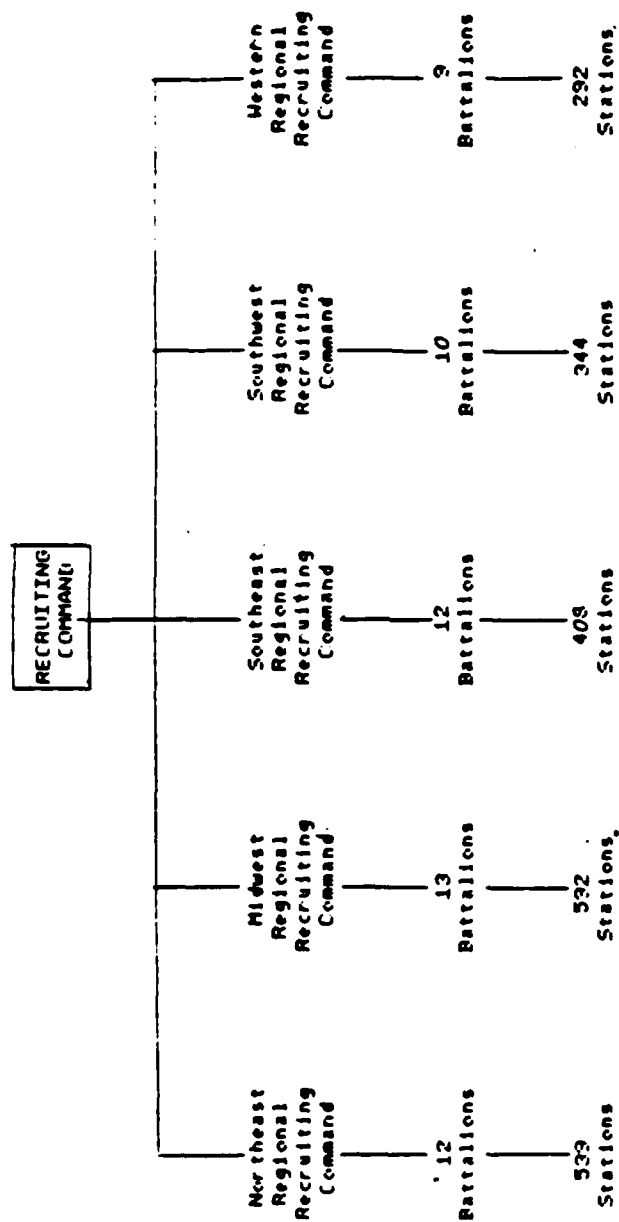
(1) Sampling methods can provide economies and other benefits where there is a significant workload. The toll calls listed in the monthly telephone bill, less those that are excluded by administrative procedure, define the toll call certification workload.

(2) Figure 2-4 presents an estimate of the percent of the Army installations having various levels of certification workload. For example, 20 percent of the installations have less than 500 toll calls per month to certify; 29 percent have more than 10,000 per month to certify; or if 1,500 or more calls per month signals the need for possible certification by sampling methods, then about 60 percent of the Army installations are candidates. The curve shown in figure 2-4 was derived from the regression curve fitted to the frequency histogram of figure 2-1 with \$2 per toll call as the conversion factor. Note that table 2-1 computed the average cost per toll call to be \$2.08.

(3) The toll call certification workload within the recruiting command depends upon how the brigades establish this responsibility. If certification is performed at the station level, the number will, of course, be small. It could be accomplished by the geographical area covered by one or more telephone companies, by the company level personnel, or battalion level communications-electronics (C-E) officer, or even at the brigade level. This command does not require that all toll calls be certified. Each recruiting station has a listing of telephone prefixes for which no record is required. Calls within the chain-of-command and some internal business calls, such as calls concerning entrance examinations, are not subject to certification. In fact, only about 30 percent of the toll calls that are made at the station level require certification by administrative procedure. These toll calls must be recorded on DA Form 360 with an explanation of their purpose, such as check of references, school records, medical history, birth certificates, police records, etc.

c. Status.

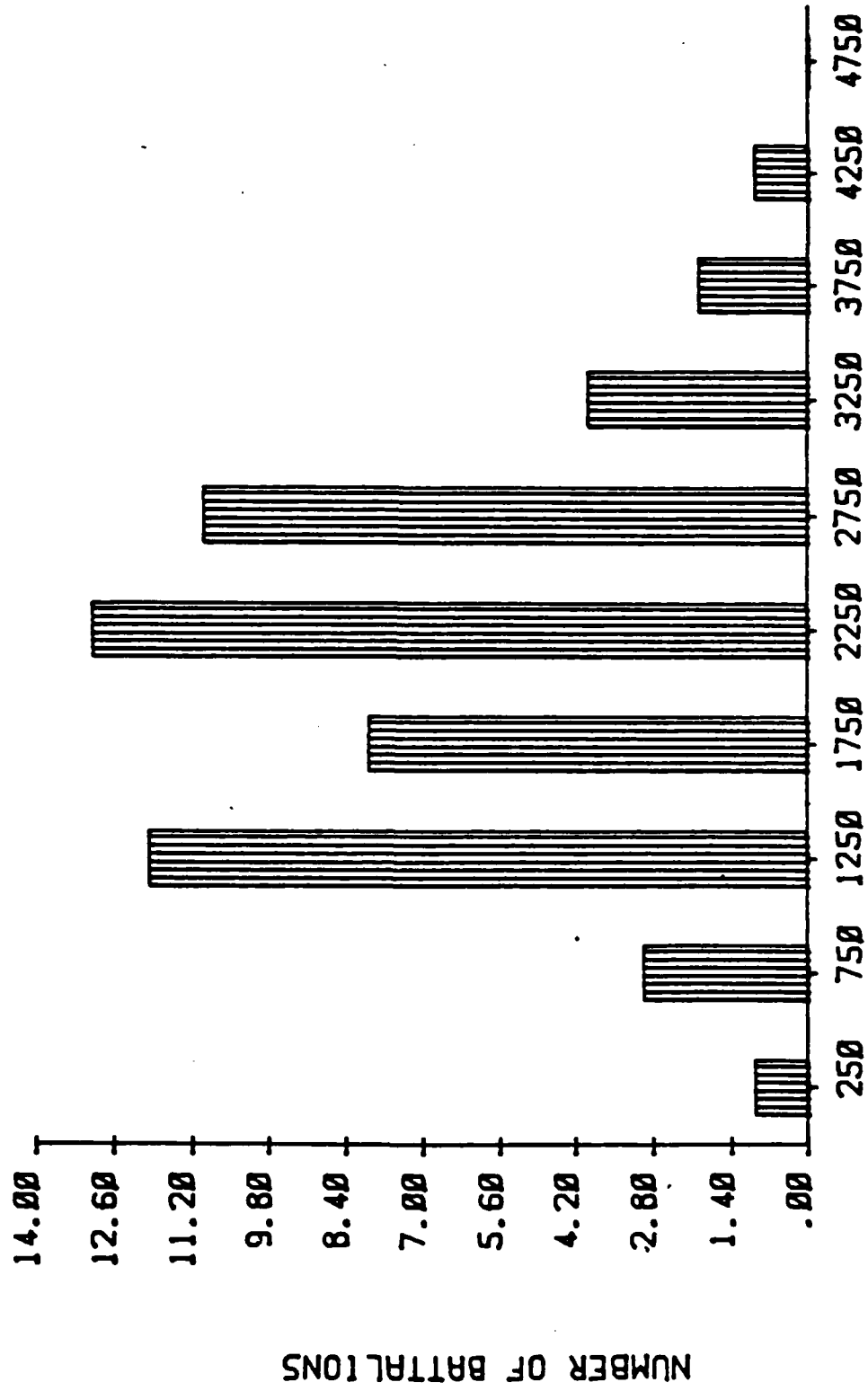
(1) The application of sampling methods implies that some percentage of unofficial toll calls is allowed to remain in the telephone bill when it is paid. When the person responsible for toll call certification executes the sampling procedure in good faith, he is relieved of any liability for these illegal, improper, or incorrect payments. The role of the sampling plan is



Recruiting Command Organizational Structure

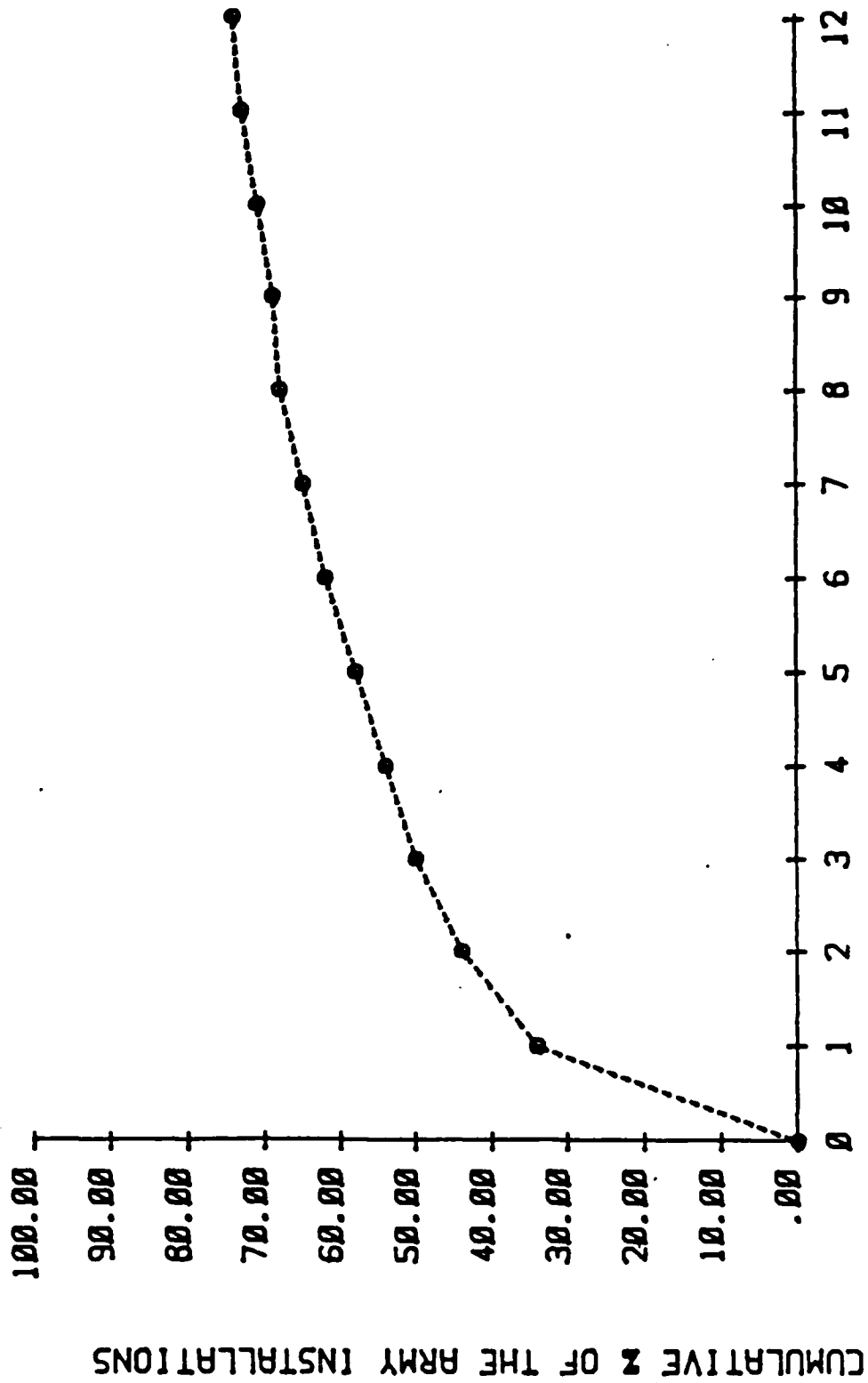
Figure 2-2

MONTHLY RECRUITING COMMAND BATTALION TOLL CALL CERTIFICATION WORKLOADS



AV NUMBER OF TOLL CALLS TO CERTIFY PER MONTH

TOLL CALL WORKLOAD AT ARMY INSTALLATIONS



MONTHLY TOLL CALL CERTIFICATION WORKLOAD (1000 CALLS)

Figure 2-4

to discriminate between the allowable percentage and the level where an excessive percentage of unofficial toll calls exist. AR 105-23, chapter 5, applies a 5 percent limit to certain audits which, if exceeded, requires that all billed calls be checked for discrepancies. If the standard were to be defined such that no more than 5 percent of the toll calls be unofficial, then it is apparent from table 2-1 that some installations are not ready for sampling methods even though their workload is large enough, namely, Fort Belvoir, White Sands, Fort Ritchie, and Fort Dix, but the unofficial toll call percentages at Fort Hood and Rock Island indicate that sampling methods are appropriate. Tobyhanna and Jefferson PG have very low percentages of unofficial toll calls, but their small volume of calls eliminates them from consideration in the application of sampling methods. The above statistics for unofficial toll call occurrence may be misleading because other unofficial toll calls probably remain undetected or otherwise disguised.

(2) Followup to determine source is required for all toll calls that are believed to be unofficial. For those unofficial calls where the source is identified, toll charges and an administrative fee are collected, and disciplinary action may be taken. The success in assigning responsibility for unofficial toll calls varies between locations as is observed in figure 2-5. White Sands with an 87 percent success rate in identifying source (3,075 out of 3,973) contrasts with the 15 percent rate at Fort Dix (52 out of 343). Effective corrective measures to control telephone abuse are essential to the startup and continuance of a sampling program.

(3) USAISC-USAREC at Fort Sheridan has pursued an aggressive audit and training policy in an attempt to control the unofficial use of telephone facilities. This has involved inspection teams from the brigade level, IG, USAISC-USAREC, and the U.S. Army Audit Agency (USAAA). Excerpts from typical audit reports are contained in figures 2-6 and 2-7. The focus of these audits is to check compliance with administration procedures. This is not quite the same as auditing to determine whether or not a toll call was for official government business. When official calls are made but not documented, they are scored as unofficial by implication. Conversely, unofficial calls could be documented to appear as official calls. Note the comment on figure 2-6 for West CO and North CO wherein records were not maintained contemporaneously. Figure 2-7 reflects the status of compliance to administrative requirements at several battalion level locations. Based upon the audit findings presented in figures 2-6 and 2-7, none of the battalion level organizations are sufficiently under control to permit sampling methods.

(4) The application of sampling methods also depends upon evidence of control on a month-to-month basis. Table 2-2 provides month-to-month data for White Sands and Fort Hood, two locations that appear ready for sampling for other reasons. Fort Hood remains in statistical control throughout the 6-month period. This is because unofficial toll call percentages lie beneath the Upper Control Limit (UCL); however, White Sands does not. Based on this condition, White Sands is ineligible for sampling methods.

(5) Table 2-1 presents the cost per toll call averages for all calls and for unofficial calls. By inspection, it is seen that there are important

□ ALL CALLS
 ▨ UNOFF CALL
 ▩ UNK CALLS

TOLL CALL COST COMPARISONS

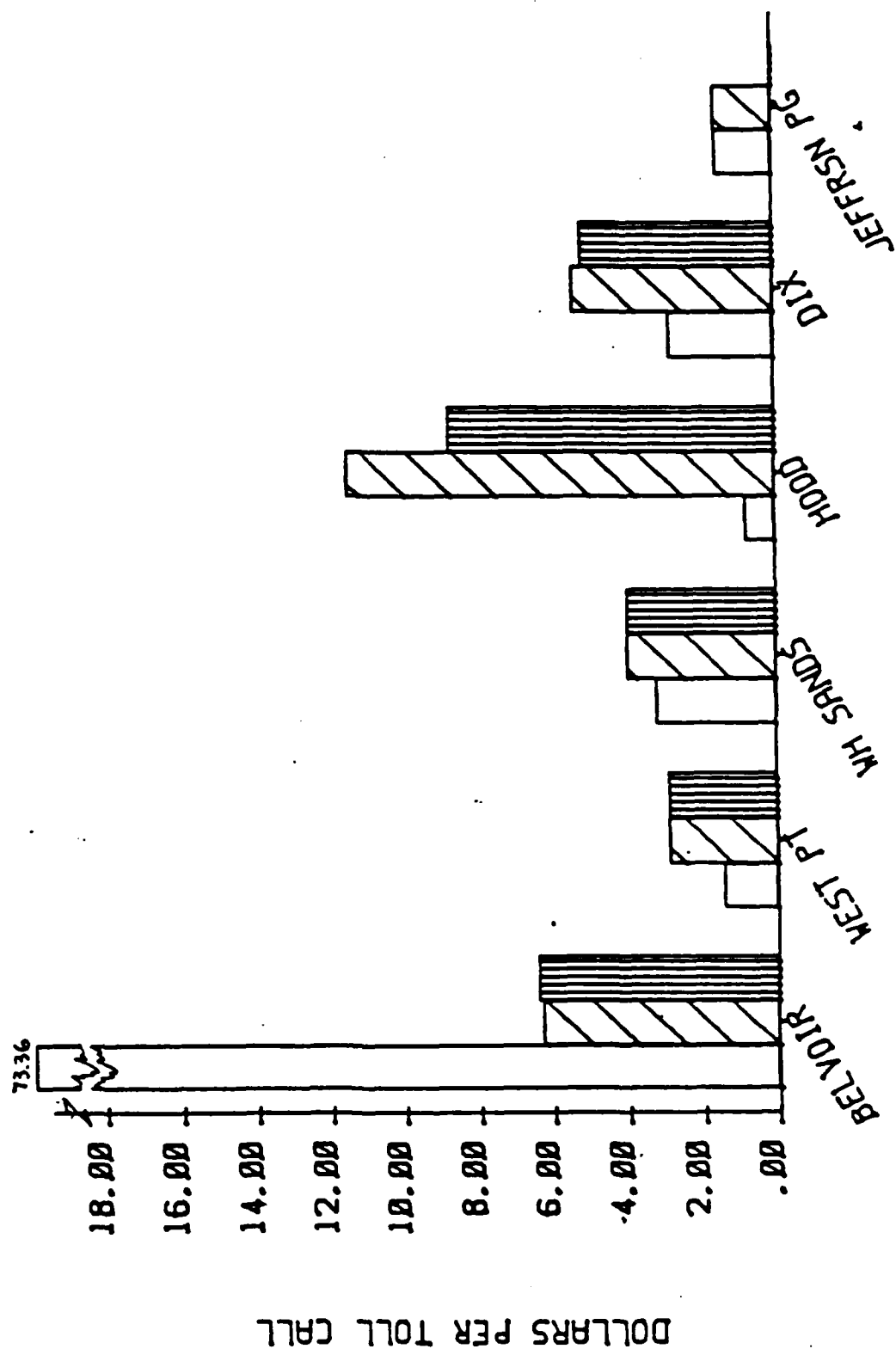


Figure 2-5

4. Comments/Telecommunications Checklist:

a. Item 4 - DA Form 360. DA Form 360s were available for all telephone bills reviewed. A review of the DA Form 360s revealed that, although not all telephone calls were recorded, a high percentage had been recorded as calls were made. All calls were subsequently reviewed and verified even though they had not been included on the DA Form 360. A list of all bills reviewed follows:

FACILITY	DATE OF BILL	# CALLS REVIEWED	# CALLS RCD ON DA 360	# CALLS LOGGED	REPRESENTS	
					% LOGGED	UNVERIFIED \$ PAID
West OD*	19 May	203	48	46	96%	\$ 1.20
North OD*	21 Apr	234	53	53	84%	7.80
Lake Charles RS**	28 May	152	43	39	90%	5.89
Beaumont RS	5 Jun	278	87	64	73%	39.16
Beaumont OD	1 Jun	395	16	3	82%	6.36
Pasadena RS	15 May	82	70	63	90%	13.65
Houston Sharpstown	23 May	186	186	167	90%	28.68
Conroe RS***	21 May	1040	170	77	45%	168.51

*A number of calls were apparently logged after receipt of the bill.

**58 collect calls.

***Bill contained 90 collect calls. Station personnel indicated billing contained call detail for collect calls they did not realize had to be recorded. This situation should improve on future billing/DA Form 360 reconciliation. The May bill had 51 collect calls unrecorded.

Figure 2-6 Extract from the telecommunications inspection report of recruiting battalion Houston, dated 25 Jul 84.

COMMUNICATIONS INSPECTION RESULTS FY-84

2D Recruiting Brigade (SE)

X = MAJOR PROBLEM AREAS

BATTALION	LAST INSP	RESULTS SAT UNSAT	(30) % OF REQ TOLL CALLS LOGGED 360	(15) DA FORMS MISSING	(2) FORMS ADMIN COMPL	(30) 3-DIGIT PREFIX LIST(S)	(5) UNOFF TOLL CALLS	(5) CERT OF UNLOGGED TOLL CALLS	(5) COLLECTION PROCEDURES	(3) EXCESS TEL SERVICE	(3) THIRD PARTY	(2) CSA BILL COMPAR
ATLANTA	Nov 83	X	22.0	X	X	X	X	X	X	X	X	X
BUCKLEY	Aug 84	X	13.4	X	X	X	X	X	X	X	X	X
CHARLOTTE	Aug 84	X	00.0 (1)	X	X	X			X	X	X	X
COLUMBIA	Apr 84	X	55.3		X					X	X	X
JACKSONVILLE	Sep 83	X	49.8		X		X			X	X	X
LOUISVILLE	Jun 84	X	00.0 (1)	X	X	X	X	X	X	X	X	X
MIAMI	Feb 84	X	49.2	X	X	X			X	X	X	X
MONTGOMERY	Oct 83	X	36.0	X	X			X		X		X
NASHVILLE	Mar 84	X	89.0		X				X	X		X
RALEIGH	Aug 84	X	79.2		X					X		X
RICHMOND	Aug 84	X	11.9	X	X		X	X	X	X	X	X
SAN JUAN	Aug 84	X	32.4		X		(2)	(2)	(2)	(3)	X	X

(1) Percent of compliance could not be determined due to inaccurate 3-digit prefix list

(2) Could not be determined because of missing telephone bills

(3) Could not be determined because of missing CSA(s)

	APR	MAY	JUN	JUL	AUG	SEP	TOTALS	AVERAGES
WHITE SANDS								
Total Calls	13317	13712	13678	16004	15918	15789	68418	14736
Number of Unofficial Calls	591	539	460	1760	623	649	4622	770
Percent Unofficial	4.44	3.93	3.36	(11.00)	3.91	4.11		5.23
Upper Control Limit (UCL)	5.81	5.81	5.81	5.75	5.75	5.75	15914	2632
Cost of Unofficial Calls (\$)	2200	1943	1653	5844	2027	2247		3.44
AV Cost per Unoff Call (\$)	3.72	3.60	3.59	3.32	3.25	3.46		
FORT HOOD								
Total Calls	6930	6740	8330	8810	10830	8460	50160	8360
Number of Unofficial Calls	35	53	46	75	24	67	300	50
Percent Unofficial	0.50	0.79	0.55	0.85	0.22	0.79		0.60
Upper Control Limit (UCL)	1.48	0.88	0.85	0.85	0.82	0.85	3460	577
Cost of Unofficial Calls (\$)	334	431	605	716	468	906		11.53
AV Cost per Unoff Call (\$)	9.54	8.13	13.15	9.55	19.50	13.52		

$$UCL = \bar{p} + 3\sqrt{\frac{\bar{p}(1-\bar{p})}{n}}$$

where n = number of toll calls and \bar{p} = average percent unofficial calls.

Table 2-2. Month-to-Month Toll Call Data (1984).

differences between these averages. Unofficial calls are the high cost calls at West Point, Fort Hood, and Fort Dix; the low cost ones are the suspect ones at Fort Belvoir. This type of data is useful in guiding the certification review even when sampling methods are not appropriate.

3. SAMPLING OPERATIONS.

a. Sampling plans provide decisions that determine whether or not the population from which the sample is drawn will be certified; therefore, it is necessary to define exactly what constitutes the population. The certification requirements of AR 105-23 focus only on toll calls that are billed by the telephone company, but not all of these calls are included in the population to be sampled. For example:

(1) If the caller makes arrangements with his telephone control officer (TCO) to make an unofficial call, that information is forwarded to the communications-electronics (C-E) officer, along with the payment of the toll call charges. These calls are excluded from the population to be sampled.

(2) If the caller is authorized to make toll calls on certain prefixes without having to record the information on DA Form 360, as is the practice in the recruiting command, the calls are excluded from the population.

(3) Some calls do not become part of the population because they are always checked; such as, overseas calls made through an operator, and calls that are specifically forbidden but happen due to extenuating circumstances as is the case with some collect calls and third-party calls. Credit card calls normally are not subject to review because they are assigned to a responsible individual.

(4) Long-distance calls made on the AUTOVON network, the FTS system, WATS lines, and FX lines do not appear on the telephone company listings and, therefore, are excluded.

b. Each telephone call is either official or unofficial. An official call is one in which government business is transacted. IAW AR 105-23, if a toll call is not recorded on the DA Form 360, where required, it is circled by the TCO and returned to the C-E officer for followup. These calls are considered to be unverified, or in sampling plan parlance, defectives. The number of defectives in a sample, among other factors, determine the acceptability of the population. This decision is unaffected by subsequent findings that the call was indeed an official call or was erroneously charged by the telephone company.

c. The statistical sampling plan approach to toll call certification can be implemented by a variety of attribute-type sampling plans. Attribute plans are those in which a sampled item is either good or bad; e.g., the toll call being audited is either official or it is not. DOD recommends the sampling plans and procedures of MIL-STD-105D, but other types and variations are readily available that can be used with proper approval.

d. The MIL-STD-105D sampling plans are designed to provide levels of protection against wrong decisions for a range of population sizes by defining the sample size required and the number of sampled units that are allowed to be defective in the sample, and yet permit acceptance of the population.

Figure 3-1 presents MIL-STD-105D sampling plans that apply to the population sizes found in toll call certification. The basic assumptions upon which the statistical probabilities rely are that (1) the process that generates the population is in a controlled condition, and (2) the sampled units are selected in a random and representative manner. Figure 3-2 describes the procedure for MIL-STD-105D sampling plans. The cost impact of defective units can be used to establish the acceptance criteria, as noted in paragraph 3n(2) wherein major defectives or equivalent major defectives are counted. Three levels of sampling plans are listed: tightened, normal, and reduced. When the sampling plans are first introduced, the normal level is used. Then, if population quality deteriorates, the tightened level is used, or if it demonstrates continued high quality, the reduced level is used. Figure 3-3 shows how sampling results dictate the sampling levels to be used.

e. Another sampling technique used is chain sampling. This system makes use of the cumulative results for samples from the current and previous months. The procedures achieve protection against wrong decisions comparable to that of MIL-STD-105D, but with reduced sample size. It also has the built-in feature of immediate response to varying population trends. Figure 3-4 describes the procedure for the typical chain sampling plan.

f. The statistical sampling plans which approach periodic monitoring are called skip-lot sampling plans. As the name implies, one or more monthly toll call bills can be certified without audit based upon a superior history of control. Figure 3-5 presents the characteristics of these sampling plans.

g. The protection afforded by statistical sampling plans against wrong decisions are depicted by Operating-Characteristic (O-C) curves. The ordinate of these curves is the probability of acceptance; the abscissa is the incoming percentage defective of the lots (monthly toll call listing). Each point on the curve defines the probability of acceptance for the percent defective of the population being offered for review. Two points on this curve are used to describe what is the allowable percent defective, defined by the Acceptable Quality Level (AQL), and what is the unacceptable percent defective. The percent defective with a probability of acceptance of 0.95 is defined as the AQL; the percent defective with probability of acceptance of 0.10 is termed the Lot Tolerance Percent Defective (LTPD). The shape of the curve is established by the sample size and the number of defectives in the sample that is allowed for lot acceptance. The O-C curve is the device used to show when different sampling methods afford identical risk control. Figure 3-6 shows how MIL-STD-105D sampling plans are equivalent to chain sampling plans.

h. The level of control evidenced by an Army installation/activity must be better than the normal level sampling plan LTPD for sampling procedures to be used. When the level of control reaches the AQL percentage or less, a skip-lot

Figure 3-1: MIL-STD-105D Attribute Single Sampling Plans where n=sample size, AC=acceptance number, RE=rejection number

Toll Call Population Size	Sampling Level	Acceptance Quality Level (AQL)								
		1.5%			2.5%			4.0%		
		n	AC	RE	n	AC	RE	n	AC	RE
151-280	Reduced*	3	0	1	8	0	2	5	0	2
	Normal	32	1	2	32	2	3	32	3	4
	Tightened	50	1	2	50	2	3	50	3	4
281-500	Reduced*	13	0	2	8	0	2	8	1	3
	Normal	50	2	3	50	3	4	50	5	6
	Tightened	80	2	3	80	3	4	80	5	6
501-1200	Reduced*	13	0	2	13	1	3	13	1	4
	Normal	80	3	4	80	5	6	80	7	8
	Tightened	125	3	4	125	5	6	125	8	9
1200-3200	Reduced*	20	1	3	20	1	4	20	2	5
	Normal	125	5	6	125	7	8	125	10	11
	Tightened	200	5	6	200	8	9	200	12	13

*If the AC is exceeded, but the RE has not been reached, accept the toll call population, but reinstate normal sampling review on the next month's population.

Figure 3-2: Single Sample Procedure to Determine Toll Call Population Acceptability

Review sample of n toll calls

If the number of defective toll calls found

Does not exceed
the quantity AC

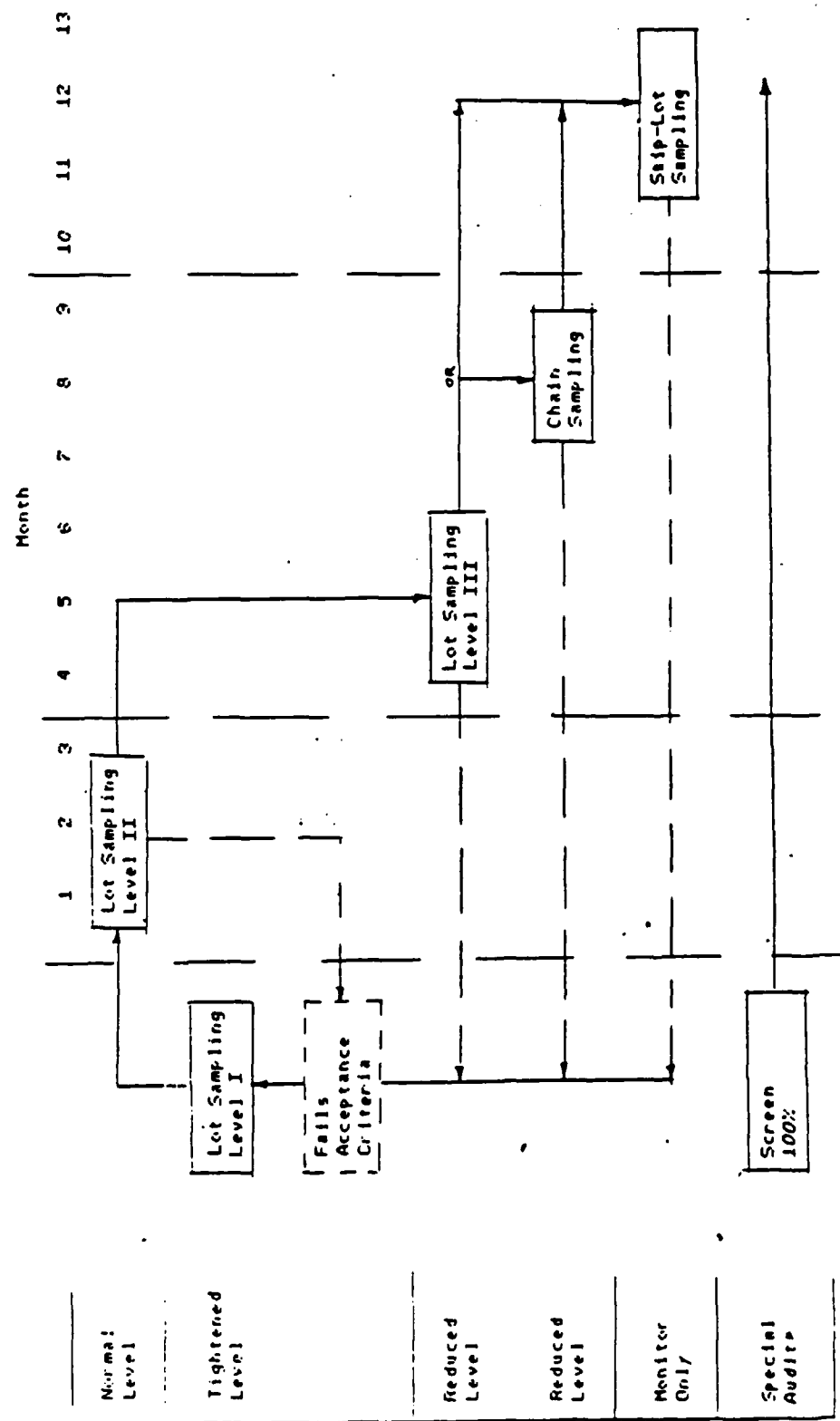
Exceeds the AC
quantity but is
less than the RE
quantity

Equals or exceeds
the quantity RE

Certify the
remaining toll
calls in the
population

Return to
normal level
sampling plan

Review all the
remaining toll
calls in the
population



Transition to Reduced Sampling Methods

Questionable calls, follow-up on problem areas, high cost toll costs, etc.

Figure 3-3

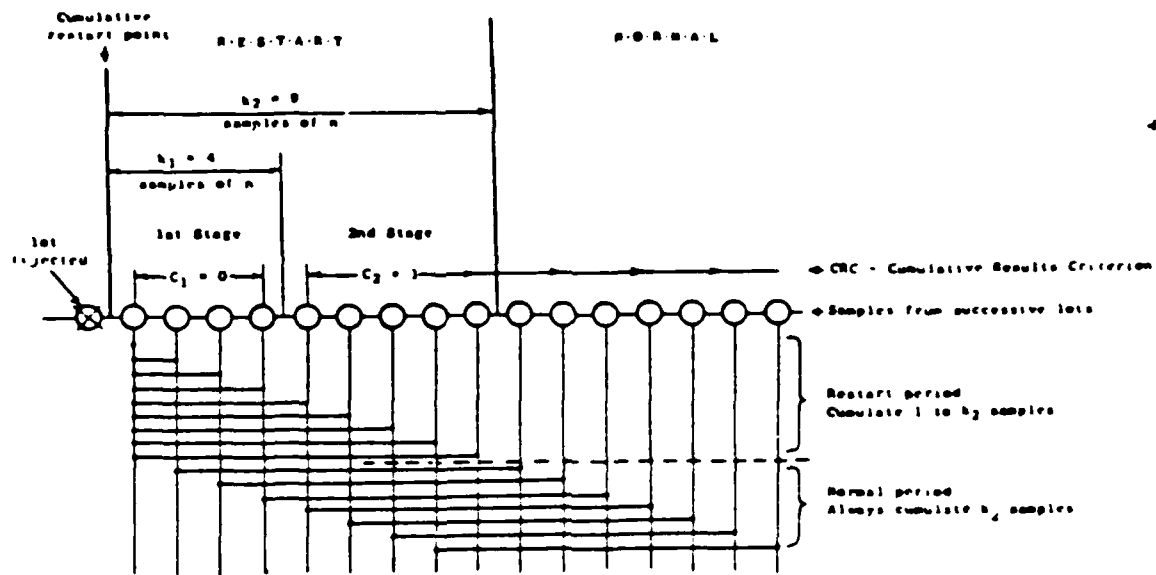
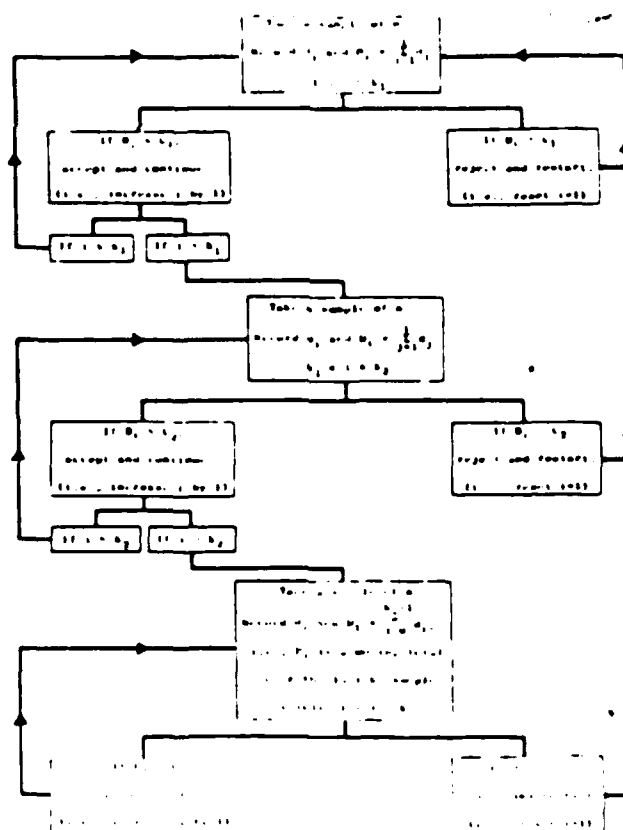


Diagram of a Two-Stage Chain Sampling Plan with $k_1 = 4$, $k_2 = 9$



Flow Chart of Operation, Two-Stage Chain Sampling Plan

Figure 3-4

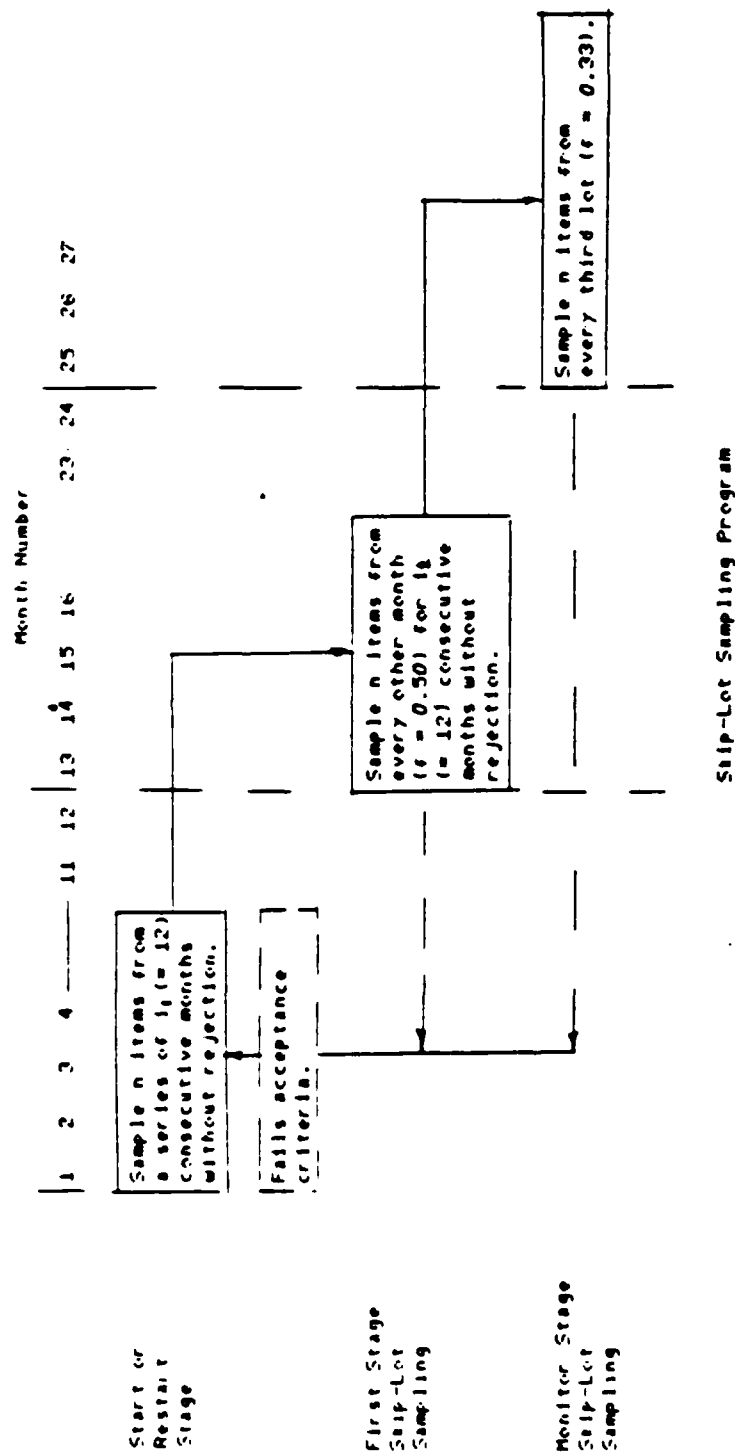
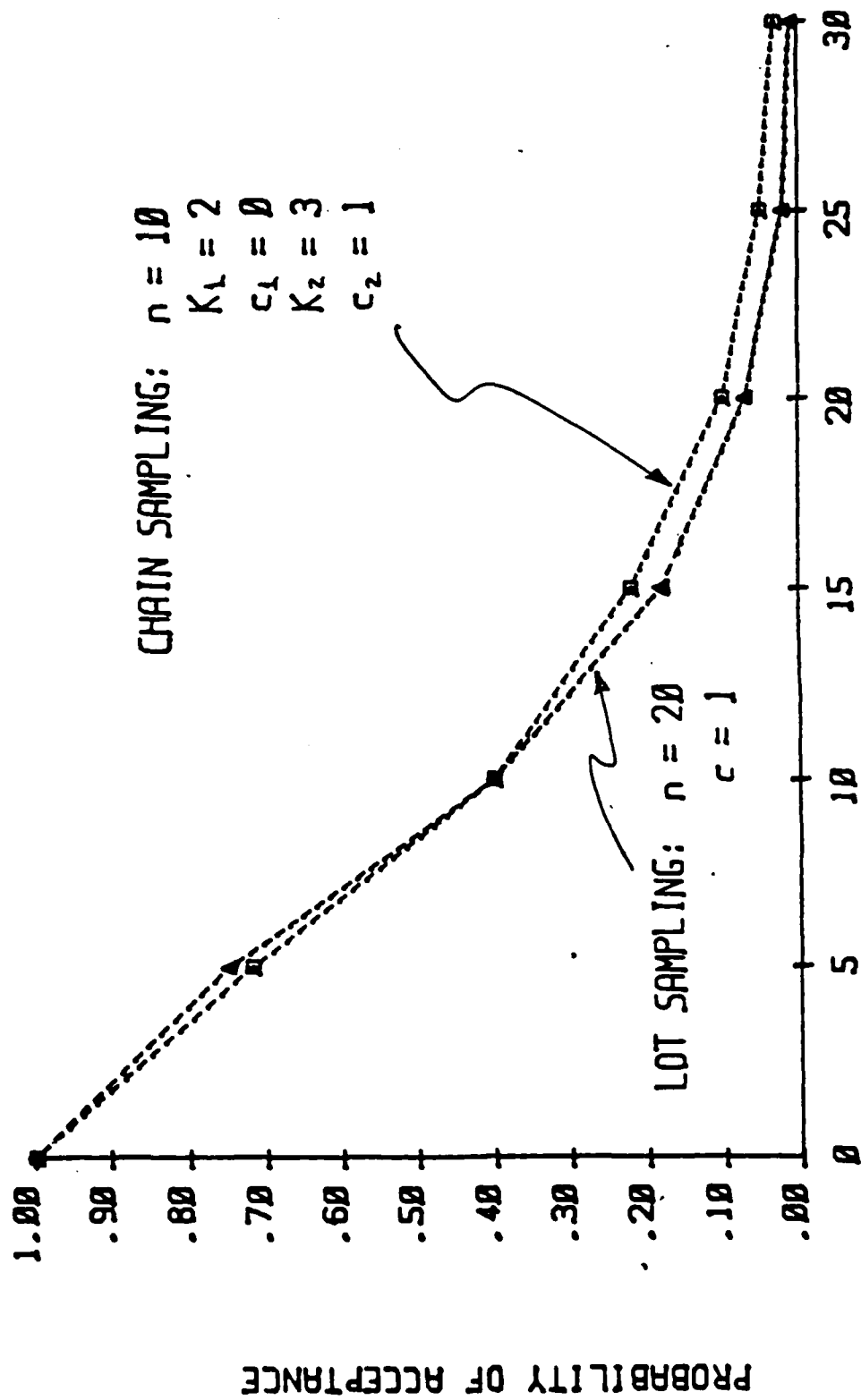


Figure 3-5

COMPARISON OF OC CURVES FOR LOT SAMPLING & CHAIN SAMPLING



INCOMING PERCENT DEFECTIVE

Figure 3-6

type sampling plan can be used. Figure 3-7 shows the O-C curves for the normal, tightened, and reduced levels to indicate the variation in risk levels.

i. Three different AQLs are presented in this study: 1.5 percent, 2.5 percent, and 4.0 percent. The sampling plans, O-C curves, and related sampling plan characteristics are shown in figure 3-8 for the range of lot sizes that occur in the toll call certification process.

j. The use of sampling methods requires a study be made to determine (1) the level of control that exists with respect to toll call certification, and (2) the amount of economics that result from the procedures to be used. A simple control chart should be instituted with upper and lower limits to track the population trends. In addition, the unofficial calls observed must be documented along with the corrective action followup taken. If the level of control that is found permits initiating a sampling program, the control chart should be continued to monitor status for the subsequent toll call bills. If the level does not yet permit sampling, the control chart serves as a management tool to direct actions that will eventually allow the application of sampling. The data for the control chart should include the following elements:

(1) Sampling plan used (or 100 percent audit).

(2) Number of toll calls sampled, including:

Originators number.

Number called.

Duration.

Charge.

Organization.

Audit result (unofficial or certified).

Followup started on unofficial toll calls and date started.

(3) Total toll calls on bill.

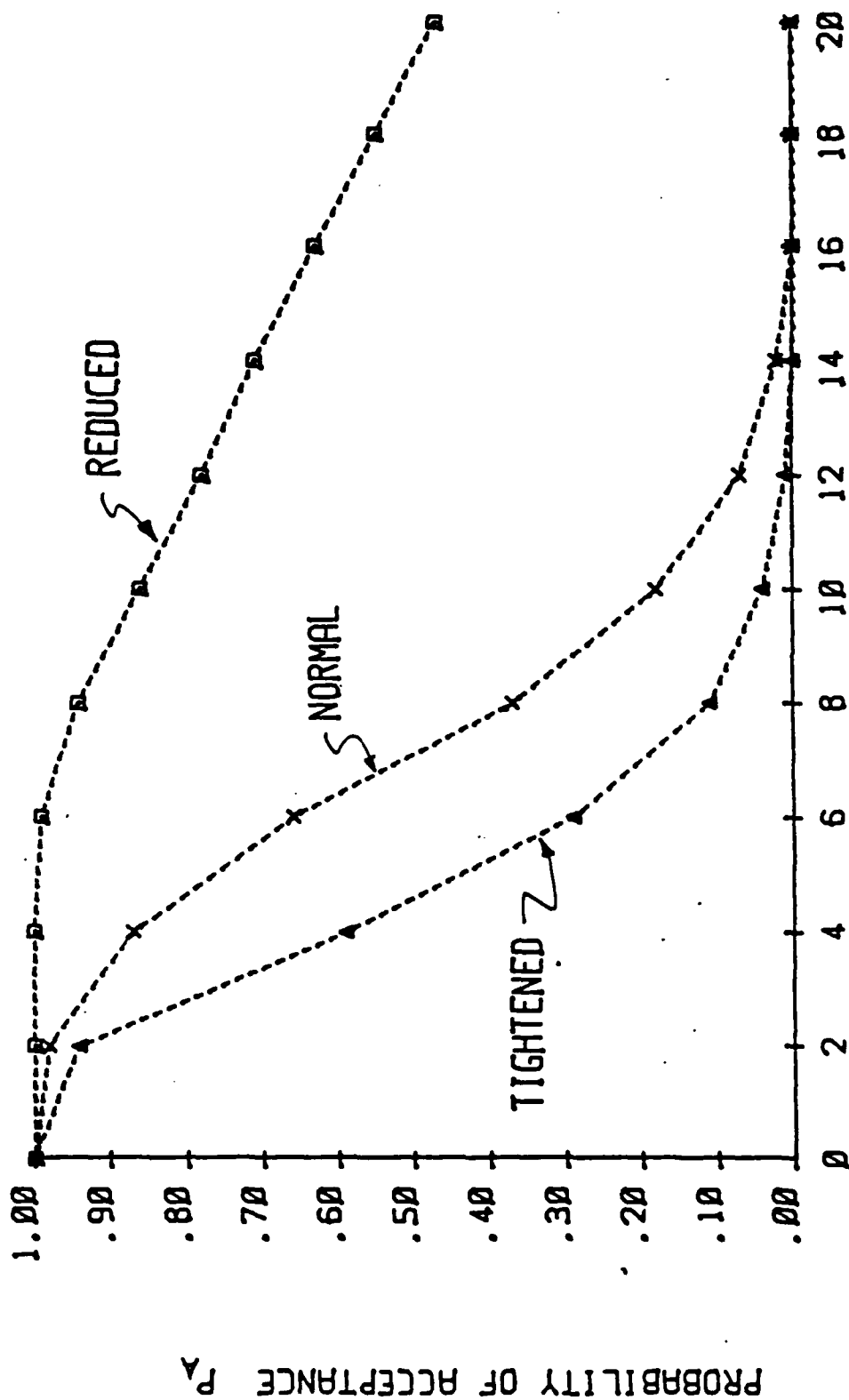
(4) Total dollar value of the toll calls.

(5) Auditors name and audit date(s).

k. The selection of the sample must be random and representative of the population.

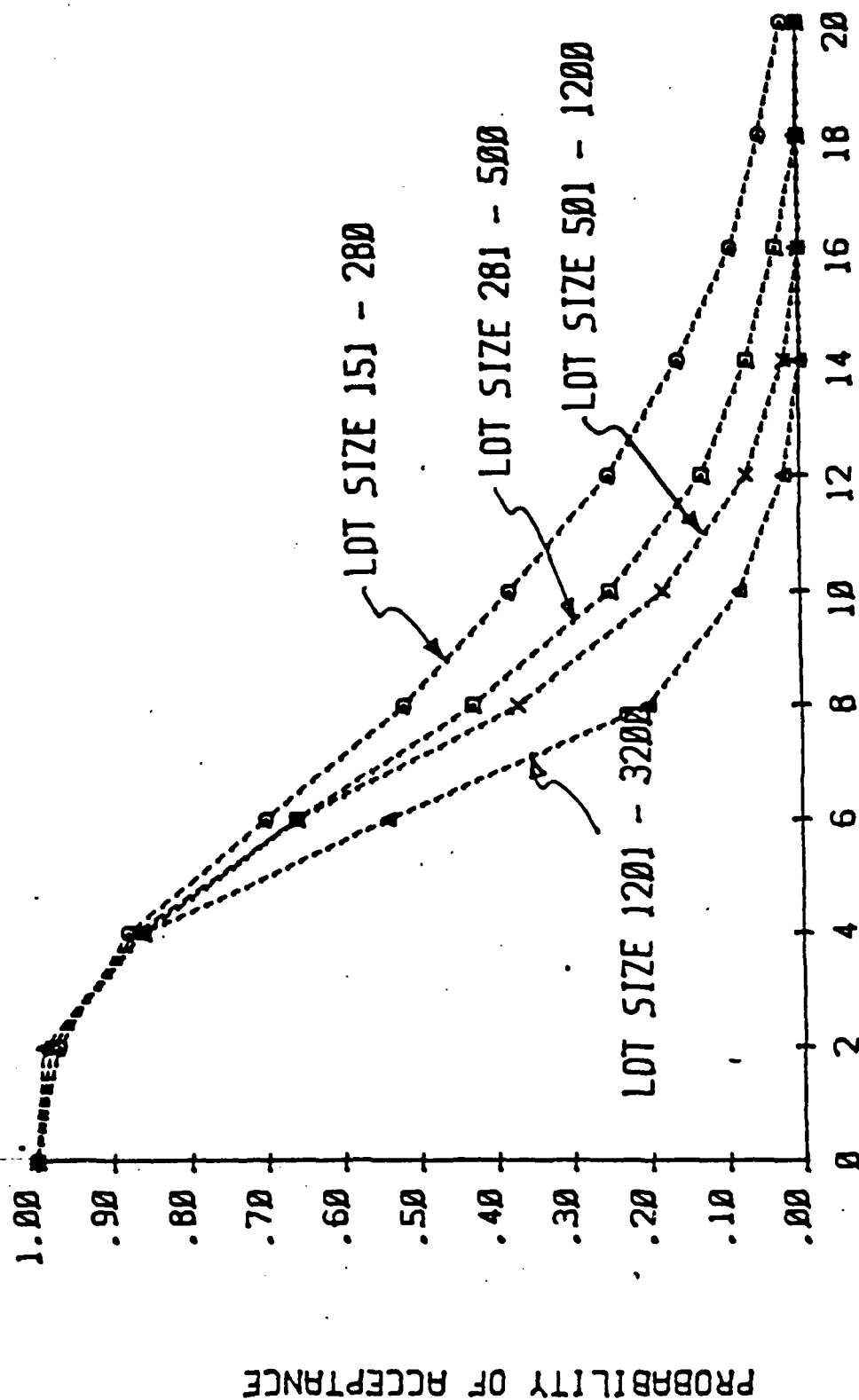
(1) To ensure randomness, the toll calls to be audited should be selected based upon objective procedures such as applying the tables of random numbers. To assure representativeness, the population may be subdivided into subgroups, with similar characteristics (reflecting organizational entities, toll charge groups, etc.) with random samples drawn from the subgroups. One way to use a random numbers table for toll call sampling is to use the toll call

SAMPLING LEVELS FOR AQL 2.5%, MIL-STD-105D



INCOMING PERCENT DEFECTIVE

OC CURVES FOR RANGES OF TOLL CALL POPULATION SIZES
 NORMAL LEVEL SINGLE SAMPLING AQL OF 2.5% MIL-STD-105D



INCOMING PERCENT DEFECTIVE

Figure 3-8

identification provided by the format of the telephone company listing: page number and item number of the page. Enter the random table in some objective manner, such as at the point of a dropped pencil, toss a coin to decide to proceed up or down the column, and use the first two digits of the table for the page number and the third for the item number of the page to form a list of the toll calls to be sampled.

(2) Another technique is to decide before hand on some arbitrary assignment of numbers to constitute the sample. A variation of this method is to divide the lot into a number of segments and then, before sampling, decide on the number of samples to be taken from each segment.

1. The sample size is determined by the maximum tolerable error and confidence levels that are established by management for the costs involved. Stratification of the population is a device for limiting sampling to significant costs which may exclude the high cost toll call charges.

m. Selected samples are audited to determine if they are toll calls of an official nature using, but not limited to, the criteria described in paragraph 3a. The audit should look into any questionable DA Form 360 entries to confirm that they are indeed official toll calls.

n. Sampling plan acceptance criteria:

(1) The sampling plan may specify the acceptance criteria for the population based upon defectives in the sample. If the number of defectives does not exceed the acceptance criteria, the population is considered to be certified. The estimated dollar value of defectives in the portion of the population is estimated from the formula:

$$C = \frac{N}{n} \times D$$

where:

C = Estimated dollar value of invalid toll call charges expected to remain in the certified population.

N = Number of toll calls in the population.

n = Number of toll calls in the sample.

D = Total dollar value of the toll call charges in the unverified toll calls found in n.

(2) The sampling plan may specify the acceptance criteria for the population based upon major defectives in the sample. Defectives are classed as major defectives or minor defectives based upon their toll call charges. Population acceptability is established on the basis of major defectives where two or more minor defectives are combined to constitute an equivalent major

defective. Another variation for evaluating defectives is to define a standard dollar value as a major defective. Then add up the dollar values of all defectives found in the sample. Divide the total by the standard dollar value to determine the number of equivalent major defectives. Compare the number of major defectives and partial major defectives to the sampling plan acceptance criteria.

4. SAMPLING PLAN COST ANALYSIS.

a. The application of statistical sampling procedures is dictated by the prospect of gaining economies. Real savings in personnel cost obtain only when the time saved can be used advantageously or where staff reductions can be made. Sampling methods may be used also where better systems and management control result without additional costs.

b. The costs associated with implementing and continuing a sampling system should not exceed the savings that accrue. Costs incurred are categorized as nonrecurring costs and as recurring costs.

c. Nonrecurring costs. Figure 4-1 summarizes the costs that are encountered when implementing a sampling system. These costs are estimated to be approximately \$1,000, an amount that will be covered within the first few months of any sampling program. Nonrecurring cost effort includes the following:

(1) Perform an economic analysis of the various alternatives for accomplishing toll call certification. Costs of assimilating historical data (number of toll calls, number of unofficial calls, costs of unofficial vs. official toll calls, characteristics of unofficial toll calls, followup of unverified calls, management reports, historical records) are not unique to sampling programs as they are requirements of AR 105-23 now.

(2) Have the Cost Validation Center (CVC) validate the economic analysis IAW ASR 37-3.

(3) Document and approve the sampling program plan and the detailed implementing procedures.

(4) Indoctrinate the operating personnel in the provisions of the sampling program plan and the detailed implementing procedures. Only those personnel who have received this training should be allowed to direct or participate in the sampling operations.

(5) Miscellaneous expenses include providing worksheets, forms, training materials, and special equipment used for sorting toll call information when defining the population to be sampled.

d. Recurring costs. Figure 4-2 summarizes the costs that are encountered after a sampling system has been implemented. Figure 4-3 indicates the monthly savings that can be realized for a range of lot sizes when the sampling program is operating. Recurring cost effort includes the following:

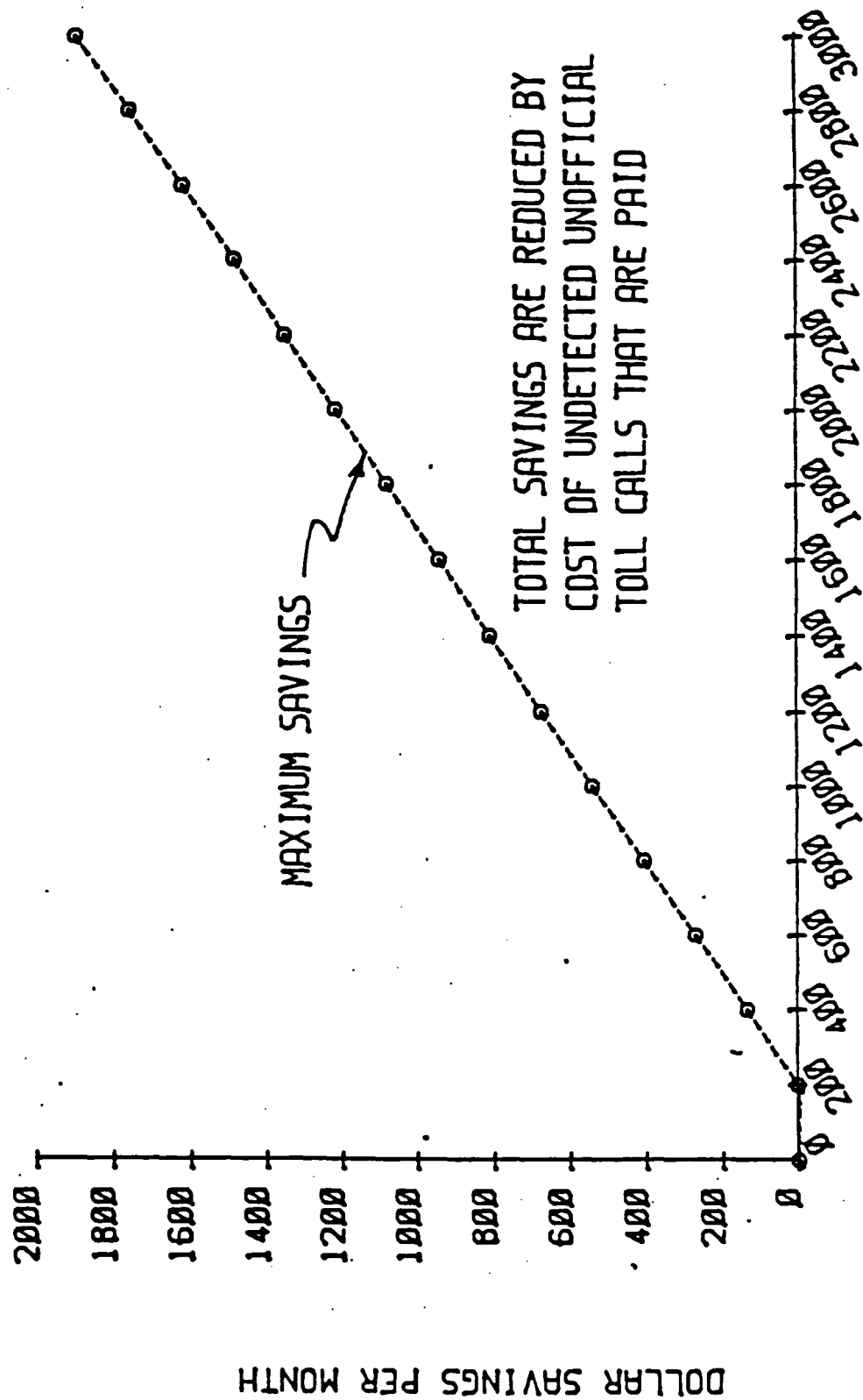
Figure 4-1. Nonrecurring Sampling System Costs

	<u>Labor Grade</u>	<u>Labor Rate/Hr</u>	<u>Estimated Hours</u>	<u>Cost</u>
<u>Nonrecurring Costs</u>				
Perform an economic analysis (EA) of alternatives	GS-7	\$11.90	20-40	\$ 238-476
Validate the EA savings	GS-11	17.62	4-8	70-141
Document sampling program plan and procedures	GS-9	14.56	8-24	117-350
Indoctrinate personnel	GS-11	17.62	2	35
Miscellaneous				<u>120</u>
			Total	\$580-1,122

Figure 4-2. Recurring Sampling System Costs/Month

	<u>Labor Grade</u>	<u>Labor Rate/Hrs</u>	<u>Estimated Hours</u>	<u>Cost</u>
Define population to be sampled	GS-3	\$7.85	4	\$30.61
Select sample 0.48/call				
Audit the sampled toll calls 0.22/call				
Document audit findings	GS-3	7.85	4	30.61
Evaluation cost of the undetected, unofficial toll calls in the population	GS-3	7.85	4	30.61

TOLL CALL CERTIFICATION COST SAVINGS FROM SAMPLING



NUMBER OF TOLL CALLS REVIEWED PER MONTH

(1) Define the population to be sampled. Paragraph 3a describes some cases where toll calls are excluded from the population to be sampled. When stratification is employed, the toll call population is divided into subgroups, some of which may be sampled, while others are audited 100 percent or not at all. This segregation process can be accomplished either manually or by data processing equipment.

(2) Select the sample to be reviewed and perform the audits. The sample selection process is critical, but need not be a time-consuming operation. The detailed procedures should specify the methods to be used, as indicated in paragraph 3k. These methods are tailored to fit the particular organization's situation. The audit determines if the sampled toll calls are official or unofficial according to the guidelines of paragraph 3a.

(3) Document the audit findings, including the data listed in paragraph 3j.

(4) Estimate the dollar value of undetected unofficial toll calls in the portion of the population that was not audited, where the population is accepted on a sampling basis. One simple technique to use is described in paragraph 3n.

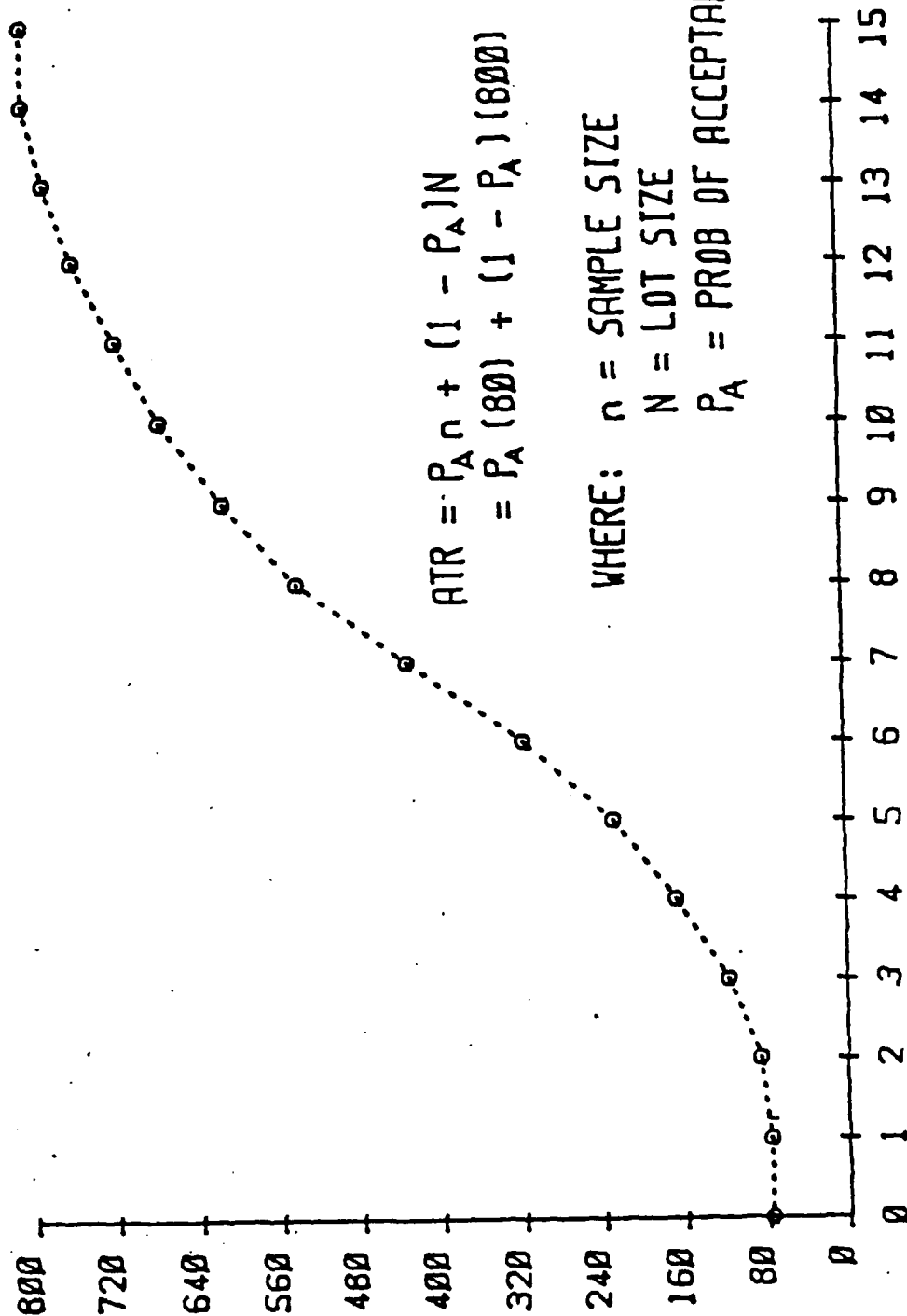
(5) Where the population is not accepted because the sampling plan acceptance criteria is exceeded, the population may be screened 100 percent or only some portion thereof may be audited. The followup action should be delineated in the sampling program plan.

e. The number of toll calls needed to be reviewed in order to certify the toll call population depends upon the unofficial toll call percentage in the population and the followup action taken when an acceptance decision cannot be made. Figure 4-4 shows the cumulative average sample number based upon the followup action to review all of the toll calls in the population in event of a reject decision based on sample results. Perhaps a more enlightened approach to the remaining population is to concentrate on those areas where problems were found. The quantity to review under this approach then lies somewhere between the sample size and the total quantity in the population, as shown in figure 4-4.

f. A stratification approach will provide control of the costs associated with the payment of unofficial toll calls that remain undetected in the population when it is accepted by a sampling procedure. This requires a 100 percent review of the high cost toll calls, or because cost derives from distance and duration, either of these factors may be used too. Paragraph 2c(5) highlights the benefits of stratifying by cost/toll call. Checking all of the high cost toll calls eliminates them as possible contributors to the cost of undetected unofficial calls. Figure 4-5 presents a truncated histogram of telephone calls from an organization in which the calls of duration of 10 minutes or less have been eliminated. This may suggest that any call under 10 minutes in duration will not be audited and previous experience that unofficial calls are usually longer in duration. Applying a 100 percent review of all

AVERAGE NUMBER REVIEWED PER MONTH FOR LOT SIZE OF 800

AVERAGE TOTAL NUMBER OF TOLL CALLS REVIEWED (ATR)



$$\begin{aligned} \text{ATR} &= P_A n + (1 - P_A)N \\ &= P_A (800) + (1 - P_A) (800) \end{aligned}$$

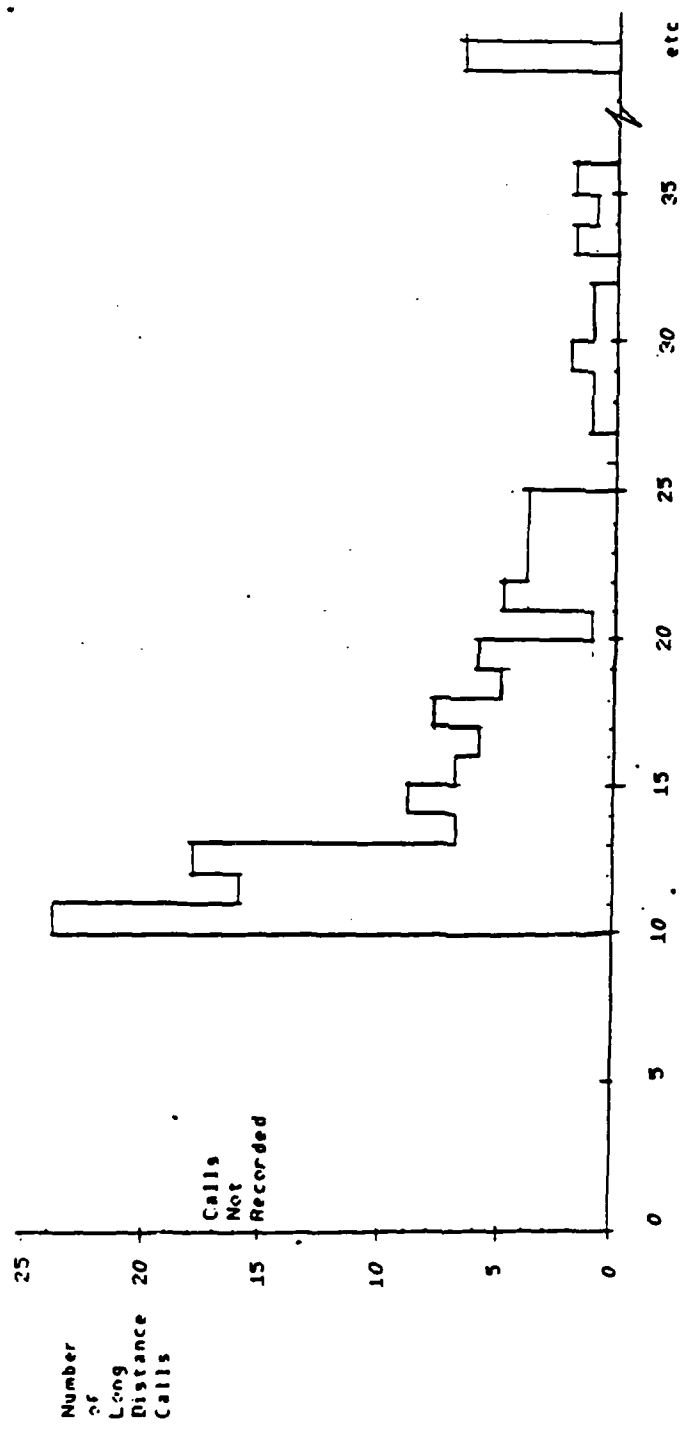
WHERE: n = SAMPLE SIZE

N = LOT SIZE

P_A = PROB OF ACCEPTANCE

PERCENT OF TOLL CALLS IN POPULATION THAT ARE UNOFFICIAL

Figure 1.1



Frequency Distribution of Long Distance Calls by Duration of Call

Figure 4-5

calls of 25 minutes or more eliminates the higher cost undetected, unofficial calls. The population subject to sampling then consists of those calls between 10-25 minutes in duration. The costs thus bounded will minimize the costs of undetected, unofficial calls.

5. RECOMMENDATIONS:

a. With the cooperation of the C-E officer at Fort Hood, conduct a trial run applying sampling methods to certify toll calls. This action should serve the twofold purpose of developing text to revise AR 105-23, as well as setting up a sampling certification program at Fort Hood. Fort Hood, and possibly Rock Island, have sufficient workload and exhibit adequate control to consider adopting such a program. The other installations/activities reviewed, eight installations and the recruiting command activity, are not ready to introduce sampling methodology.

b. Request that the Army audit agencies (IG, AAA, etc.) include reviews of telephone usage records and practices to evaluate the adequacy of controls and to highlight the telephone abuse problem. It is estimated that up to 40 percent of the calls made are unofficial in nature. The limited survey made in this study showed a wide variation in percentage of toll calls that are determined to be unofficial. The lack of response and the partial responses from some locations in this study imply that the fundamental data needed to assess the unofficial usage of telephone service is unavailable there. Audit reports published by the Navy show that this area is receiving considerable attention.

c. Perform economic analyses at Army installations/activities to examine the various alternatives that might be used to accomplish toll call certification. This action forms the basis for justifying sampling methods and other time/cost savings opportunities. It also defines the magnitude and nature of the telephone abuse problem to guide corrective measures, which when implemented, should enable some form of stratified approach to certification at each location. Typical alternatives to investigate are described in table 5-1.

d. Use MIL-STD-105D single sampling plans where statistical sampling plans are justified. Before instituting these plans, the analysis to justify the program should be reviewed by an independent agency to confirm the projected savings and other benefits.

e. Define the sampling plan risks to be as follows:

(1) The toll call population is acceptable for certification where 5 percent of the calls are unofficial; this corresponds to Acceptable Quality Levels (AQL) of up to 5 percent for any sampling plan.

(2) The toll call population is acceptable for certification if less than 1 percent of the total toll call charges remaining in the telephone bill when it is paid are for unofficial calls.

Table 5-1. Toll Call Certification Alternatives

1. Management Controls. Establish rules and policies to cover AR 105-23 impact within the organization. Check to see that the system of control is operating effectively. Utilize the audit services of the Army (IG, AAA, USAREC brigade level inspection teams, etc.). Discipline those found to be abusing the access to telephones. Maintain visibility of costs, institute budgetary controls, and incentives/penalties. Certify the toll calls on a purely spotcheck basis.
2. Controlled Access. Route all toll calls through an operator for accountability. Route calls during off-duty hours through an operator. Limit telephone service outside of the installation/activity to certain individuals or grade levels. Lock up phones when unattended.
3. 100 Percent Audit. Check all toll calls in the telephone bill with the documentation required by AR 105-23 or administrative directives. For installations/activities with a small number of toll calls per month (150 or less), this is the preferred method.
4. Random Sampling. When justified, accomplish toll call certification by an approved statistical sampling program. The sampling plans should provide the flexibility to react to population trends so that increases in telephone misuse are met with tightened requirements, and problem-free history justifies greater risks through reduced requirements. Where stratification is practiced, different subgroups can be subject to the sampling acceptance criteria appropriate to their particular circumstances. In this way, costs can be minimized and effort can be directed to those subgroups requiring attention.
5. Status Monitoring. Review questionable toll calls, ones that are high cost, long duration, have an unusual destination, are made at unusual times, emanate from new activities on the installation, are repeatedly made to the same destination, or have been problems before. This approach, although not a statistically sound sampling approach, should be used to supplement other alternatives. Where historical evidence indicates that the dollar value of unofficial toll calls is very low (1 percent or less of the total toll call billing), status monitoring should suffice as the certification method.
6. Stratified Audits. Stratify the population of toll calls into subgroups and certify the toll calls from the subgroups as noted below:
 - a. Stratify the population based upon economic considerations. All high cost toll calls should be reviewed. Unofficial toll calls often are the high cost calls, as was found in the survey of Army installations. Moreover, the elimination of the high cost unofficial toll calls from populations that are accepted by sampling is a means of controlling the erroneous payment of undetected unofficial toll calls. On the other hand, it is not cost-effective to review the insignificant cost toll calls. Significant, but not high cost

Table 5-1. Toll Call Certification Alternatives (Cont)

toll calls then constitute a subgroup which may be subject to sampling or some form of status monitoring to establish certification.

b. Stratify to isolate questionable calls of the telephone company listing. Review only the questionable toll calls or perform some form of sampling on the remainder.

c. Stratify by organizational entities or other responsible jurisdictions. Certify the toll calls of each with appropriate methods in consideration of their past history, message recording equipment, and other relevant factors.

d. Stratify by separating known problem areas from problem-free areas. Apply 100 percent audits or tightened inspection levels on the toll calls of the former and appropriate methods on the latter.

e. Stratify with combinations of the above. For example, perform 100 percent audit of high cost calls, questionable calls, and known previous problem areas, and sample the remainder to establish certification.

f. Update AR 105-23 to acknowledge that statistical sampling methods can be used to accomplish certification of toll charges. The following requirements should be defined when statistical sampling methods are used:

(1) A study must be made that will provide evidence that:

(a) The toll call population to be sampled exhibits adequate control with regard to level of conformance and month-to-month variability over a period of time no less than 6 months.

(b) The certification plans will result in economies over a period of 2 years or less.

(c) There is an overall program to maintain visibility and control of unverified toll calls, to react to adverse trends, and to enable reduced sampling levels, where appropriate.

(2) The analysis and conclusions of the study will be subject to validation by the cost validation center (CVC).

(3) The certification program must be documented by the installation/activity and approved by HQ, 7th Signal Command, or their delegate. The program should establish:

(a) Responsibilities.

(b) Sampling plan procedures.

(c) Sample selection methodology.

(d) Corrective action policy.

(e) Data, records, and management reports.

(f) Periodic audit and survey provisions.

(g) Guidelines for the program plan. These could be given in appendices to AR 105-23 to be lifted word-for-word into the program plan.

(4) Control charts must be maintained to track progress and status to justify continued sampling operations and reduced levels, where applicable.

END

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